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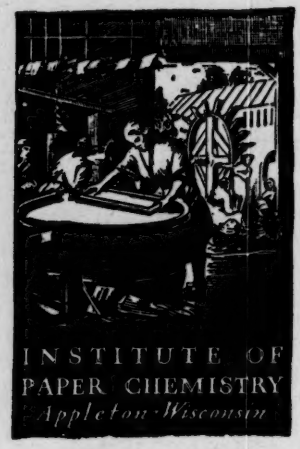
BULLETIN

OF

THE INSTITUTE OF PAPER CHEMISTRY



AFFILIATED WITH

LAWRENCE COLLEGE

APPLETON, WISCONSIN

LIBRARY NOTES

FEBRUARY • 1949

Volume 19 Number 6

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Books and Pamphlets Added to the Library During January

ALMANACS

The WORLD ALMANAC and book of facts for 1949. 64th year of publication. New York, New York World-Telegram, c1949. 912 p.

CHEMISTRY, INORGANIC

SNEED, M. CANNON, and MAYNARD, J. LEWIS. General inorganic chemistry. New York, Van Nostrand [c1942, reprinted 1948] 1166 p.

CHEMISTRY, PHYSICAL AND THEORETICAL

BOWEN, E. J. Physical chemistry. Post-graduate lectures. London, Oil and Colour Chemists' Association, 1944. 32 p.

DISSERTATIONS, ACADEMIC

DOCTORAL DISSERTATIONS accepted by American universities 1947-1948 (number 15). Compiled for the Association of Research Libraries, ed. by Arnold H. Trotier. New York, Wilson, 1948. 137 p.

INDUSTRIAL RESEARCH

DUNSHEATH, PERCY. The graduate in industry. London, etc., Hutchinson's Scientific and Technical Publications [1947] 276 p.

HOLMSTROM, J. EDWIN. Records and research in engineering and industrial science. 2d ed., rev. and enl. London, Chapman and Hall, 1947. 366 p.

INSECTICIDES

FREAR, DONALD E. H., comp. A catalogue of insecticides and fungicides, with a foreword by F. F. Lininger. Waltham, Mass., Chronica Botanica Co., 1948. v. 2: Chemical fungicides and plant insecticides. 153 p.

PAPER MAKING AND TRADE

JOSHI, K. B. Paper making (as a cottage industry), with appendix E "Migration of paper from China to India" A.D. 105 to 1500, by P. K. Gode [4th ed.] Maganvadi, Wardha [publ. by J. C. Kumarappa for the All India Village Industries Association, 1944, reprinted] 1947. 226 p.

The PULP and paper engineering catalogue of Canada and Newfoundland; a consolidated catalogue of equipment and supplies

available to the pulp and paper industry of Canada and Newfoundland with index facilitating purchase [5th ed.] Gardenvale, Que., National Business Publications Ltd., 1935. 142 p.

The PULP and paper manual of Canada . . . [8th-11th] 14th, and 15th ed. Gardenvale, Que., National Business Publications, Ltd., 1939-42, 1946-47.

PAPER SPECIALTIES

SCHMITT, JOACHIM. Die deutsche Krepp- und Buntdruckpapierindustrie. Buhl-Baden, Verlag Konkordia, 1938. 119 p. (available on microfilm only)

PRINTING

KOTTE, HANS. Papier im Druck, eine kleine Werkstoffkunde. Einbeck (Niedersachsen), Carl Garte Verlag, 1948. 104 p. + 31 samples.

SPECTRUM ANALYSIS

HARRISON, GEORGE R., LORD, RICHARD C., and LOOFBOUROW, JOHN R. Practical spectroscopy. New York, Prentice-Hall, Inc., 1948. 605 p.

TRADE DIRECTORIES

LOCKWOOD'S directory of the paper and allied trades. 74th ed., 1949. New York, Lockwood Trade Journal Co., Inc., c1948. 1420 p.

VISCOSITY

ANDRADE, E. N. DA C. Viscosity and plasticity, being the substance of three post-graduate lectures to the Oil and Colour Chemists' Association. Cambridge, W. Heffer & Sons Ltd. for Oil and Colour Chemists' Association, London, 1947. 82 p.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

ADHESIVES

MORRIS, J. Adhesives. Brit. Packer 10, no. 12: 15-18, 36 (December, 1948).

Following a general discussion of adhesives and adhesion, the author considers the points which must be studied to ensure a good bond. The surfaces must receive a thin even layer of adhesive. The viscosity of the adhesive must be kept within a definite range, which is sometimes difficult in machine application. Not only must the right adhesive be used, but it must be used to the best advantage; it must be made up and diluted when necessary only according to the manufacturer's recommendations. As far as is possible, ready-to-use adhesives are advocated. A discussion is given of animal glues (skin and bone, casein, and fish), vegetable glues (natural gums and starch adhesives), rubber and rubber latex, sodium silicate, synthetic adhesives, laminations, and heat sealing. The purchase, handling, and storage of adhesives, operating conditions under which the adhesive may be used, and field conditions are considered. R.R.

SEILER, CHARLES J., and MCLAREN, A. D. Theories of adhesion as applied to the adhesive properties of high polymers. ASTM Bull. no. 155: TP258-60 (December, 1948); *cf.* B.I.P.C. 19: 299.

A study of adhesion requires a knowledge of three factors—namely, the character of the bond between the adhesive and the surface to which it adheres, the nature of the film, and the nature of the surfaces permitting adhesion. A knowledge of optimal application methods may determine whether a good or a poor bond is obtained from an adhesive. However, the differences in bond strength obtained from adhesives having similar physical properties but dissimilar chemical composition can only be explained in terms of specific adhesion factors. Electrical forces resulting from the dipole moments of polymer polar substituents and ordinary dispersion of forces have been used to explain the strengths of adhesive bonds. 25 references. E.S.

ASPEN

SCHANTZ-HANSEN, T. Logging methods and peeling of aspen. Lake States Timber Digest 3, no. 5: 5-6, 10; no. 7: 3-4; no. 8: 13-14 (Dec. 16, 1948, Jan. 13-27, 1949); U. S. Dept. Agr. Forest Service. Lake States Forest Experiment Station. Lake States Aspen Report no. 3: 1-14 (July, 1948).

Most aspen logging is by conventional methods. Data are given which indicate that the aspen pulpwood can be produced most economically with hand tools and dray skidding in stands of small average diameter. Much of the power equipment available and used with other species does not seem to be well adapted to logging aspen pulpwood stands. Tree logging has been successfully carried out in good-quality stands. Aspen is a relatively heavy wood when green, the generally accepted weight for green pulpwood being about

5000 pounds per cord. This weight emphasizes the need for mechanization of loading. Peeling is usually done by hand, and can be done efficiently only from about May 15 to July 15. The conventional drum barker is quite efficient for use with wood seasoned at least one year. The use of the Allis-Chalmers Stream Barker, and friction, hammer, and lathe or knife machines for use in the woods, and the chemical treatment of living trees to facilitate barking and hasten seasoning are discussed. For making high-quality paper, the bark must be completely removed; for wallboard, it is usually included with the wood. Data on cutting and skidding time are tabulated. R.R.

ASSOCIATIONS

VAN HAGAN, CHARLES E. Forest Products Research Society enjoys rapid growth. Paper Trade J. 127, no. 27: 41-2 (Dec. 30, 1948).

The foundation, development, and activities of the Forest Products Research Society with headquarters in Madison, Wis., are outlined. E.S.

BACTERIOLOGY

TANNER, FRED W. Paper and paper board in the food industry —public health aspects. Am. J. Pub. Health 38, no. 12: 1688-93 (December, 1948).

The author shows that the procedures used in papermaking are powerfully germicidal for micro-organisms of public health significance and even for some species which are not. The results obtained by different research workers are reviewed, including the possibilities of contamination by starch as a sizing agent and slime formation in mills. All data indicate that coliform bacteria are absent in the pulp stream in paper mills and in the finished paper. Bacteria are destroyed in paper mills by cooking under pressure with chemicals, bleaching with strong chlorine and hypochlorite, and passage over drier rolls heated to high temperatures. Paper leaving the drier rolls is not sterile; however, it contains only viable, spore-forming bacteria which are not pathogenic. Many species of bacteria die in paper because of lack of moisture. The presence of starch binds water and makes it unavailable to bacteria, thereby speeding their death. Only aerobic spore-bearing bacteria survive. A bacterial count standard, such as has been proposed for finished paper, is of no value for determining its sanitary quality, because the type of bacterium is fully as important as the number present. To offer an enumeration of harmless, relatively heat-resistant bacteria as having sanitary significance shows a distinct lack of appreciation of what sanitation really is. 13 references. E.S.

BARK

PRIAULX, ARTHUR W. Weyerhaeuser chemists develop valuable products from bark. Western Pulp and Paper 1, no. 4: 12-14 (November, 1948); *cf.* B.I.P.C. 18: 6, 737-8.

Much the same information is given in this article on the production and use of Silvacon products developed by the Weyerhaeuser Timber Co., as is contained in the earlier references. R.R.

BLEACHING

LANDOLT, A. Bleaching with fluorescent bleaching agents. Textil-Rundschau 3, no. 11: 376-82 (November, 1948). [In German]

"Fluorescent bleaching" agents are of great importance for producing a pure white effect on textile and paper fibers, because they make it possible to shorten the customary bleaching procedures without exerting any detrimental effect on the mechanical properties of the fibers. Two new agents in this class are described, Uvitex RS, which is suitable for brightening cotton, and Uvitex WS, for brightening wool, natural silk, and acetate rayon. The affinity of the two products for the fibers under different conditions is illustrated by curves, indicating the degree of brightening obtained (by "brightening" is meant the fluorescent light emitted in the visible spectrum and reflected by the treated goods). The fluorescent bleaching agents known today belong to different chemical groups. They are mostly colorless substances, which show a bluish or violet fluorescence in solutions. Their one main difference from fluorescent dyestuffs lies in the fact that they have no color of their own (*cf.* also Ciba Rev. no. 72: 2661 [February, 1949]). E.S.

BOARD DRYING

ÖGLAND, N. J. Hot-air treatment of hardboard panels. Norsk Skogind. 2, no. 11: 301-5 (November, 1948). [In Swedish; English summary] *cf.* B.I.P.C. 19: 77-8.

The hot-air treatment of hardboard, as developed in Scandinavia during recent years, is generally carried out at temperatures below 160° C. on account of the danger of spontaneous combustion. However, higher temperatures may be safely used, when the heat released in the board by exothermic reactions is carefully, continuously, and rapidly removed. Higher temperatures permit not only a higher rate of operation, but result also in improved dimensional stability. The effect of the hot-air treatment on the antishrink properties is preferably followed by measuring the maximum increase in thickness (the result of swelling) after storing in water, rather than by the water absorption itself. This is exemplified by comparing heat treatment under molten metal and in air. From experiments with lignin-free board containing different amounts of hemicellulose between the fibers or in the cell wall, the author concludes that the hemicellulose component is responsible for the decrease in the swelling tendency. Birch has a higher hemicellulose content than pine or spruce. A longer period is required for a hardboard panel made from birch fiber to show the maximum effect of the heat treatment at a given temperature than for a panel made from pine or spruce. If a board of practically hemicellulose-free α-cellulose (I) and one of bleached paper pulp with 14% hemicellulose (II) are prepared and tested, characteristic differences in the modulus of rupture and water absorption can be noted between the two. After a heat treatment at 160° C., the modulus of rupture of (I) is much lower and its water absorption much higher than that of (II). When 10% hemicellulose is added to (I), its modulus of rupture increases above that of (II) and the increase in thickness decreases appreciably, although it remains still higher than that of (II). The data are illustrated in 10 graphs. E.S.

BOARD MILLS

ANON. Michigan Carton stock preparatory. The Messenger, no. 256: 3-9 (January, 1949); *cf.* B.I.P.C. 19: 229.

An illustrated description is given of the 350-ton Shartle-Dilts stock preparatory system at the Michigan Carton Co., Battle Creek, Mich., including three Hydrapulpers, three Hydrafiners, an automatic junk remover, a ragger to remove baling wires, rags, string, etc., a grit remover, and a jordan section consisting of six Miami No. 5's. A 14-inch Hydrapulper is a junk remover and ragger so fitted that it can be used on filler for short

runs instead of the big 20-inch unit, or to supplement the production of the larger machine on exceptionally heavy runs of filler stock. The system is given flexibility by special piping so that stock from the 14-inch Hydrapulper may be (1) discharged directly to a chest, (2) through the cleaning system when slushing filler, or (3) blended with filler already pulped in the big Hydrapulper. The machine headbox is built to handle four types of stock; each of the four compartments is equipped with eight separate gates to permit delivery of any stock to each of the eight molds on the paper machine. All stock chests are equipped with Agi-Flo circulation and pumping systems. A diagram is included of the Shartle-Dilts filler and liner preparatory systems. R.R.

BETTENDORF, HARRY J. Michigan Carton's new mill. Fibre Containers 33, no. 12: 52, 54, 59-60, 62, 65 (December, 1948); *cf.* B.I.P.C. 19: 229.

The new board mill of the Michigan Carton Co. at Battle Creek, Mich., was built not only to increase board output, but also to produce higher quality boxboard at greater speed with a maximum of economy and efficiency and with a minimum of handling and to provide for clay coating on the board machine. The new eight cylinder 128-inch trim high-speed Beloit machine with Shartle stock preparation equipment and Maxon Layboy began operations in June, 1948. The Angel, as the board machine is called, is rated at 200 tons a day; it operates at about 275 ft./min. on 0.03 board; the eventual capacity will be 250 tons a day. Storage is provided for 12,000 tons of waste paper and pulp, with arrangements for the segregation of different grades. A fairly detailed illustrated description is given of the stock preparation system and the board machine. The Angel is driven by a 1250 h.p. Westinghouse steam turbine with a 10 to 1 ratio, with steam generated by two Springfield boilers automatically fed with pulverized coal. White water discharge is treated in Sveen-Pedersen save-alls. R.R.

BOARD MILLS—DIRECTORIES

FIBRE CONTAINERS. Official board mill directory. Fibre Containers 33, no. 12: 74, 76, 80, 82, 84-101 (December, 1948); *cf.* B.I.P.C. 18: 356.

Lists of board mills are given including a "regular" list arranged alphabetically by states with a section for Canadian mills, giving information on stock used, equipment and machine trims, capacity, power data, grades of regular paperboard manufactured, and executive personnel; a list arranged alphabetically by name regardless of place for the United States and one for Canada, giving only the name and address; and a specialty board mill section, alphabetically arranged by states with information on grades of specialty paperboard manufactured, equipment and machine trim, capacity, and executive personnel. R.R.

BOOK MARBLING

VON HOFFMANN PRESS, INCORPORATED, *St. Louis, Mo.* Marbling magic. Inland Printer 122, no. 4: 48-9 (January, 1949).

An illustrated description is given of the steps involved in book marbling, now almost considered a lost art, because it cannot be mechanized but requires the hand of a skilled craftsman. Irish moss and water are boiled together to form a sizing solution of the correct consistency; this, with a preservative, is poured into the sizing pan and vegetable colors and ox gall are added. The colors are dropped from a brush in round blobs; a stick

is used to lay out a design and a steel comb to complete the pattern. The book edges are first washed with an alum solution to draw in the colors. One edge of the book at a time is dipped into the solution and the book then laid aside to dry. The process is repeated for each edge, as the pattern is disturbed each time the book edge is immersed. Thus, although the procedure is always the same, no two marbling patterns are ever identical. E.S.

BUSINESS CONDITIONS

CORNELL, JOHN. Business forecast for 1949. Paper Mill News 72, no. 3: 16-17 (Jan. 15, 1949); *cf.* B.I.P.C. 18: 356-7.

The author predicts another year of prosperity for American business and for the paper industry; the year will be another year of high national income, high production, and high employment, although the figures will be lower than in 1948. His analysis—details of which are given—is based upon the National Economic Budget. The estimates for 1949 are based upon the expectation of a 5% decrease in total consumer expenditures, a 25% increase in expenditures of federal, state, and local government agencies, and a 19% decline in business expenditures. The total production of paper and paperboard in 1948 was about 22,150,000 tons; in 1949 it is likely to be 21,000,000 tons or approximately 5% less. This estimate is based upon the fact that inventories in the hands of manufacturers of paper and paperboard are now of the magnitude of 500,000 tons, but more especially since the demand for paper and paper products is likely to decline slightly this year because of the close correlation between the demand for paper and the trend of general business. On the whole, the supply and demand for paper and paperboard are now in balance; essential papermaking materials are in sufficient supply. In the case of waste paper, the supply has exceeded the demand for more than a year. A tabulated comparison of paper, board, and pulp production for 1947 and 1948 is included. E.S.

CELLOPHANE

ALLEN, NELSON. Meat-film considerations. Modern Packaging 22, no. 5: 134-7 (January, 1949).

On the basis of work done on the packaging of fresh meats, the author suggests a heat-sealable film with a water-absorptive surface and low water-vapor permeability and which is resistant to liquids and high humidities. MSAT-80 Cellophane maintains the color of fresh meat satisfactorily for at least 72 hours at 34° F. when used with the wettable surface in contact with the meat. For use with prepared or cured meats, the film should have a higher WVP and should be heat-sealable and resistant to liquids and high humidities. Suggestions are given for the satisfactory control of fading. Data are tabulated on color and weight loss, the effects of temperature and light intensity on color, and sliming and molding under varying conditions. R.R.

CELLULOSE—CONDUCTIVITY

O'SULLIVAN, J. B. The conduction of electricity through cellulose. Part V. The effect of temperature. J. Textile Inst. 39, no. 11: T368-84 (November, 1948); *cf.* B.I.P.C. 18: 83-5.

The temperature coefficient of the electrical conductance of a cellulose sheet impregnated with sodium nitrate or copper sulfate, each in two concentrations, has been measured over a wide range of moisture contents. It appears to be a unique function of the moisture content, irrespective of the kind or quantity of salt present. At moisture contents above 50 parts per

100 of cellulose, the temperature coefficient is little above that in bulk aqueous solution, namely 2.4% per °C. As the moisture content is lowered, the temperature coefficient rises with increasing rapidity, reaching a value of about 11% per °C. at a moisture content of 10 parts per 100 of cellulose. The results have been considered in relation to various possible factors which might explain the effect of moisture content on the electrical conductance of salt-impregnated cellulose. It appears that, at moisture contents above 50%, the principal factor is viscous hindrance to the migration of hydrated ions in capillary channels in the cellulose. At moisture contents of 10% to 20%, the principal factor appears to be a dynamic equilibrium between broken and unbroken channels, the ions being stopped at breaks until these are repaired by condensation of water molecules from the gas phase. The values at intermediate moisture contents can be explained as being caused by a combination of these two factors. E.S.

CELLULOSE—DEGRADATION

KLEINERT, TH., and MÖSSMER, V. Heterogeneous degradation of cellulose. I. Preliminary communication: Hydrolytic degradation. Monatsh. 79, no. 5: 442-3 (October, 1948). [In German]

Results are reported on a mild heterogeneous acid hydrolysis (*N*/10 hydrochloric acid) of raw cotton at 20° C. with exclusion of light, carried out over a long period of time, so as to eliminate the influence of the diffusion process as much as possible. A parallel experiment was also made, in which two grams per liter of an active wetting agent (Igepon) were added to promote the penetration of the hydrolytic agent and overcome the resistance of the waxy and fatty constituents of the raw cotton. The plot of the average D.P. (measured viscometrically) against time gives a curve made up of two distinctly different portions, each represented by an approximately straight line. In the first portion (up to about 60 days), the D.P. falls rapidly, whereas in the second portion (after about 120 days) the decrease in D.P. is slow. The transition period occurs in the range of about 500 average D.P. The addition of the wetting agent caused a more rapid decrease in D.P. in the initial stage, but had no observable effect on the second stage. It will be shown in a later publication that the amorphous portions of the cellulose system are attacked first because of their greater accessibility, and it is postulated that these amorphous areas contain units of higher molecular weight. The changes in the textile properties of the fibers were also measured. During the first part of the degradation the drop in wet and dry tensile strengths was approximately parallel but, in the later portion, the dry tensile strength decreased more rapidly until ultimately it was about the same as the wet strength. The elongation properties also showed a difference, the dry elongation being only slightly changed by the progressive hydrolysis of the cellulose, whereas the wet elongation increased considerably. M.A.H.

CELLULOSE—HEAT OF WETTING

REES, W. HOWARD. The heat of absorption of water by cellulose. J. Textile Inst. 39, no. 11: T351-67 (November, 1948).

When hygroscopic textile materials absorb moisture, heat is liberated. Information of a fundamental nature relating to the structure of cellulose and of its affinity for water can be obtained from a knowledge of these heat changes. A review of the literature on the measurement of such heat changes is given, and a method is described for measuring the heat of wetting of textiles, from which data the heat of absorption may be derived. Results obtained for heat of wetting and heat of absorption are given for cotton,

mercerized cotton, and certain rayons conditioned on the absorption route, and the conclusion is drawn that the heat of absorption of cellulose at zero moisture regain is 283 calories per gram of liquid water (15.6 kcal. per mole of water vapor). Heat of absorption values may be calculated from moisture absorption data by the use of a modified form of the Clausius-Clapeyron equation. An example of this application is given, and it is shown that this method can provide only approximate values of heat of absorption. Finally, the thermostatic action of hygroscopic textile materials on the human body is discussed, and an idea of the considerable magnitude of this effect is given by examples calculated from the heat of absorption data. 27 references.
E.S.

CELLULOSE—OXYCELLULOSE

KENYON, RICHARD L., HASEK, R. H., DAVY, LEE G., and BROADBOOKS, K. J. Oxidation of cellulose. Ind. Eng. Chem. 41, no. 1: 2-8 (January, 1949); *cf.* B.I.P.C. 12: 175-6.

After the fundamental studies of the oxidation of cellulose by nitrogen dioxide by Unruh and Kenyon in 1936, oxidized cellulose remained at first a laboratory curiosity, until it was discovered that the material possessed hemostatic properties. The Eastman organization then decided to manufacture oxidized cellulose as a pharmaceutical raw material and Parke, Davis & Co. agreed to process it for pharmaceutical use. The vapor process was selected, based on laboratory experiments, because wartime urgency in 1945 prevented the development of the process through a small pilot plant. As the process is now operated, the starting product is surgical gauze in 36-inch wide rolls and the final product is oxidized cellulose gauze in 300-layer pads. A detailed description of the oxidation, washing, and drying stages is given, including a flowsheet and illustrations. Product specifications are included. The chemical instability of oxidized cellulose to heat and alkaline reagents accounts for its usefulness in surgery as an absorbable packing. All the oxidized cellulose marketed at present is processed by Johnson & Johnson and sold as Hemo-Pak, or by Parke, Davis & Co. and sold as Oxycel. 18 references.
E.S.

CELLULOSE ETHERS

BERGLUND, DAG TORSTEN. Sugar gels with carboxymethylcellulose. Svensk Papperstidn. 51, no. 23: 555-8 (Dec. 15, 1948). [In English; Swedish and German summaries]

The effectiveness of carboxymethylcellulose as a replacement for high-class pectins in the formation of sugar acid-gels at pH 3 has been investigated. Two controllable properties of the carboxymethylcellulose were varied: the degree of substitution (0.4 to 1.57) and the average degree of polymerization (as shown by the viscosity of a 2% solution at 20° C., which ranged from 29 to 4080 centipoises). Generally, an addition of a polyvalent cation was necessary for the formation of satisfactory gels. Aluminum sulfate was the most effective for this purpose. Qualitatively, the carboxymethylcellulose gels were inferior to pectin gels, being more turbid and tougher. The experiments showed that a certain region of the molecular weight (or solution viscosity) of the carboxymethylcellulose gave the best gels. This region was lower for gels with high sugar content than for those with lower sugar content. Carboxymethylcellulose has the advantage that the average molecular weight can be adjusted as desired. The average degree of substitution was close to 1.0 for the best preparations. Above a D.S. of 1.0, the gelling ability was greatly retarded. In discussing the differences between carboxymethylcellulose and pectin, it is suggested that the greater distance

between carboxyl groups, the irregularity of substitution along the chain molecules, and the absence of methyl ester groups may explain the poorer gelling ability of carboxymethylcellulose. 13 references. M.A.H.

SANDOR, GEORG. Cellulose ethers and their application to the textile industry. Textil-Rundschau 3, no. 12: 417-23 (December, 1948). [In German]

The cellulose ethers considered are methyl, glycol, and glycolic acid ethers. Their solubility and viscosity can be modified by varying the conditions of reaction (e.g., the degree of ripening of the alkali cellulose). The products are used for sizing purposes (water-soluble types), as thickening agents in printing pastes (particularly glycol and glycolic acid ethers), and in textile finishing. The water-insoluble ethers play an important part in so-called permanent finishes fast to washing; they are also used as fixing agents in textile printing. E.S.

TIMELL, TORE. Investigations on cellulose reactions. V. The methylation of sodium cupricellulose. Svensk Papperstidn. 51, no. 22: 537-40 (Nov. 30, 1948). [In English; Swedish and German summaries] *cf.* B.I.P.C. 19: 307-8.

Sodium cupricellulose was investigated with the objective of confirming and extending the earlier findings of Traube. This alkali-insoluble complex, discovered by Norman in 1906, can be formed by the precipitation with sodium hydroxide of a cuprammonium or cupri-ethylenediamine solution of cellulose, or prepared directly from cellulose, copper hydroxide, and sodium hydroxide. The latter method was used in this work. The material was then methylated to four different degrees of substitution (0.33, 0.98, 1.09, and 1.39) and the distribution of the substituents was completely determined for each sample according to the method outlined in part I (*cf.* B.I.P.C. 18: 506-7). The source of the cellulose was the same cotton linters used previously. Comparative methylations showed the sodium cupricellulose to be much more reactive than the corresponding alkali cellulose. It is suggested that the dissociation constant of cellulose is considerably increased by the formation of the complex. The primary hydroxyl group of the cellulose appears to be completely protected against methylation up to a degree of substitution of 1.1. Of the two secondary hydroxyl groups, the one in the 2-position is twice as reactive as the one in the 3-position. It is concluded that the primary hydroxyl is probably bound in a complex formation by the copper and becomes available for reaction only when the substitution exceeds a critical value. The solubility in water of low substituted methylcelluloses from sodium cupricellulose is discussed briefly and explained on the basis of these results. 30 references. M.A.H.

CELLULOSE FILMS, TRANSPARENT

PENN, W. S. The properties of cellulose acetate film—with special reference to "Clarifoil." Brit. Packer 10, no. 12: 21 (December, 1948); *cf.* B.I.P.C. 19: 357.

The properties of Clarifoil, a cellulose acetate film produced by British Celanese Ltd., are described. It is odorless, tasteless, rot-, mold-, grease-, and waterproof, relatively noninflammable, tough, flexible, unaffected by humidity and temperature changes, readily printed and sealed, somewhat moisture permeable, etc. It is being widely used in a wide range of thicknesses for packaging, both alone and in laminations. R.R.

CHEMICAL TESTING—PULP

FILLIUS, MILTON F. Report of Chemical Methods Committee. Tappi 32, no. 1: 38A, 40A, 42A, 44A, 46A, 48A (January, 1949).

The author discusses the major test method development problems confronting the committee, including revisions in the determination of disperse viscosity (T-230), α-cellulose (T-203), and the pH of pulp extracts (T-435). Brief reference is made to the TAPPI questionnaire sent out during the summer of 1948 and to the effect which the replies will have on the selection of methods in need of revision. E.S.

CHEMICAL TESTING—PULP—ALPHA CELLULOSE

DOERING, HELMUT. Determination of α-cellulose. Das Papier 2, no. 19/20: 359-64 (October, 1948). [In German]

Staudinger and co-workers (*cf.* B.I.P.C. 13: 467) have shown that a native cellulose of D.P. 1000 may be insoluble in cold 10% sodium hydroxide, whereas a regenerated cellulose of the same D.P. may be soluble in this same solution. The author warns against the current neglect of the surface of fibers exposed to alkali when the α-cellulose determination is made. The present standard method used in Germany is, therefore, open to serious criticism in that dilution with water, prior to filtration of the mercerized cellulose, changes the surface of the fibers. Mechanical shredding of cellulosic material must be eliminated and, after the initial mercerization, subsequent changes in exposed surface must be carefully avoided. The following method is proposed. The pulp is defibered carefully so as not to injure the fibrous structure and converted into a sheet, which is then air dried and disintegrated manually; 2.5 grams are treated at 20° C. with 30 cc. 17.5% caustic soda with the minimum amount of handling. The suspension is then filtered by suction on a Jena 11G3 crucible and washed successively with 50-100 cc. 10% sodium sulfate solution, water, about 100 cc. *N* sulfuric acid, and water until free from acid. Washing with ethyl alcohol is omitted. Results obtained by this procedure are invariably higher than those obtained by the usual standard procedure, the difference ranging from 2.1 to 4.2%. L.E.W.

CHEMICAL TESTING—PULP—COPPER NUMBER

LEMAN, A., and ULRICI, GEORGES. Glucides. II. The copper number of rag pulp. Bull. soc. chim. France no. 11-12: 1057-62 (November-December, 1947). [In French]

The authors compared the procedures for determining the copper number of cellulose according to the methods proposed by Hägglund, Schwalbe, and Koehler-Braidy. The variables causing inconsistencies in the results were studied; they included the state of subdivision of the sample, the time of contact with the reagent, and the reaction of the filters with the reagent. On the basis of these data, the authors developed a modification of the Hägglund procedure which gives lower and more constant values. A description of the method is given, which is claimed to be simple and accurate. The following copper numbers were obtained: 0.3 for rag paper with a cellulose content of 98.3%, and 0.04 for bleached cotton linters. The reaction is complete and the cellulose apparently not degraded. The Koehler-Braidy method was found to be affected by many small variations of experimental conditions, notably of temperature. E.S.

CHEMICAL TESTING—PULP—TURBIDITY VALUE

JAYME, G., and SCHENCK, U. Test showing the suitability of pulps for the production of cellulose acetate. II. Determination of

the reactivity. Angew. Chem. 60 A, no. 2: 46-7 (February, 1948). [In German] *cf.* B.I.P.C. 15: 320-1.

The method serves quantitatively to show the reactivity of various pulps toward the acetylation mixture. Instead of the extended treatment at 90° described previously, the rasped pulp is treated 10 minutes with glacial acetic acid at room temperature. As in the previous case, turbidity measurements are made immediately after the treatment and again after centrifuging for 5 and 20 minutes. The drop in turbidity is then computed; the undissolved residue is also determined. This technique permits a rapid judgment regarding the serviceability of a pulp in subsequent acetylation and also serves to show whether pretreatment would render the pulp more satisfactory as a raw material for cellulose acetate. For example if, as in the case of cotton linters or a purified beechwood sulfite pulp, the turbidity values and the insoluble residues are both low (using either procedure), the pulps are very satisfactory raw materials. On the other hand, provided a pulp shows a high residue (both after acetic acid pretreatment at room temperature and at 90° C.) and the final turbidity value is high (usually 0.011 or more), it is deemed unsatisfactory. Full tabulated data, showing the effects of the brief and long pretreatments on eight different dissolving pulps, are given.

L.E.W.

CHLORINE

HIGHTOWER, J. V. New ideas for handling chlorine. Chem. Eng. 56, no. 1: 96-8 (January, 1949).

The author describes ingenious features incorporated in the chlorine-handling system of the new Jefferson Chemical Co. plant at Port Neches, Texas. An automatic control arrangement for unloading liquid chlorine from tank cars, a pressuring system for the chlorine storage tanks which virtually eliminates the need for pressuring with air, steam-heated expansion chambers to avoid ruptures of the chlorine lines, and safety valves for pressure relief on the storage tanks are considered, including illustrations and diagrams.

R.R.

HULME, R. E., and TILLMAN, A. B. Thermodynamic properties of chlorine. Chem. Eng. 56, no. 1: 99-103 (January, 1949).

The authors present a critical evaluation of the literature on the properties of chlorine, tabulating and charting the results of their study. Information is given on vapor pressure, latent heats of vaporization, specific volume, density comparisons of gaseous chlorine, and enthalpy (sum of internal energy and the pressure-volume product), English units being used. The results are sufficiently precise for most engineering calculations. 4 charts and 3 tables. R.R.

CHLORINE DIOXIDE

HOLST, GUSTAF. Technical production of chlorine dioxide. Paper Trade J. 128, no. 1: 21-6 (Jan. 6, 1949); *cf.* B.I.P.C. 18: 287-8.

This is the complete translation of the Swedish original. E.S.

CHROMATOGRAPHY

STRAIN, HAROLD H. Chromatographic separations. Anal. Chem. 21, no. 1: 75-81 (January, 1949).

The author discusses chromatographic adsorption analysis, one of the most effective techniques for the resolution of mixtures, including methods, adsorbents, solvents and eluants, applications, and principles. Data are tabu-

lated on approximate molecular weights and kinds of substances investigated by chromatographic adsorption methods and on substances separated or isolated by adsorption or adsorbents and solvents employed. 152 references.
R.R.

CONTAINER INDUSTRY

ANON. The outlook for 1949. Modern Packaging 22, no. 5: 77-83, 169-70, 172, 174 (January, 1949); *cf.* B.I.P.C. 18: 446.

With virtually all packaging materials except metal containers now in ample supply and business at a "hesitation" point, purchasing agents are chiefly concerned with wise inventory practices, and not with availability. A table is given showing current inventory practice and delivery times for package supplies, and considerations involved in inventory policies are discussed. Because of new plants there is ample capacity for all types of containers, the transportation situation is much improved, and there is a piling up of inventories of finished packaged products. The latest Department of Commerce pulp and paper report predicts a good outlook for the paper industry, which is concentrating on quality and improved services with the return of a more normal competitive market. The information on unbleached kraft, paperboard, containerboard, fancy papers, cellophane, adhesives, inks, and plastics as raw materials, folding paper boxes, set-up boxes, liquid-tight paper containers, labels, fiber shipping boxes, paper shipping bags, fiber cans and tubes, and fiber drums as package forms, and the section on machinery are of particular interest to the pulp and paper industry. Data are tabulated on comparative costs of film and paper used in packaging and on 1948 production and 1949 prospects in package-supplying industries.
R.R.

DAY, FREDERICK T. Some novelty packs from France. Brit. Packer 10, no. 12: 24-5 (December, 1948).

The author discusses French packaging, including the growing tendency toward wrapping and the wide use of metal seal labels and fancy papers.
R.R.

NATIONAL PAPER BOX MANUFACTURERS ASSOCIATION. A survey . . . hourly production performance of setup paper box employees. Shears 66, no. 672: 20-1 (December, 1948).

All firms reporting in the survey made in November, 1948, reported a 2.7% increase in hourly production over 1947; 49.9% reported an average increase in 1948 of 8.3% per hour, 15.4% a decrease of 9.0%, and 34.7% no change. Over 25% of all firms reporting considered wage incentive plans as a principal reason for increased production. Firms using this plan reported an average hourly increase of 6.5% for 1948 over 1947, 80.1% reported a 9.7% increase on the average, and none reported decreases. Of the total number of reasons given for increased production, 27.3% credited improved management methods, 31.4% improved equipment, and 41.3% wage incentives and employee effort. Figures are also given comparing present hourly production with 1944 and the war years. R.R.

COOKING PROCESS

POLJAK, A. Cooking wood with peracetic acid. Preliminary communication. Angew. Chem. 60 A, no. 2: 45-6 (February, 1948).

Sprucewood was heated with 10% peracetic acid at about 70° C. for four hours. In one case, a 56.6% pulp yield (containing 80.1% α-cellulose, 19.2%

hemicelluloses, and 0.1% lignin) was obtained. The filtrates from this pulp contained relatively small amounts of carbohydrates which were converted to reducing sugars on hydrolysis with 2% sulfuric acid. Thus, the author accounted almost quantitatively for all the carbohydrates in the wood. During the delignification, the wood took up about 14% of oxygen, but the sugars appeared to be largely unaffected by the peracid. The oxidizing liquor contained two amorphous fractions representing 14% and 29%, respectively, of the wood; these could be separated because of the different acetone solubility. The methoxyl values were low, 1.55% and 1.9%, respectively. These fractions are being subjected to further analysis.

L.E.W.

COTTON

LESSLIE, CLAIRE, HAGEN, LAMONT, and GUTHRIE, JOHN D. Determination of wax content of raw cotton fiber; nonvalidity of preliminary treatment with hydrochloric acid. Anal. Chem. 21, no. 1: 190-1 (January, 1949).

Data are tabulated on the wax values obtained on six different samples of raw cotton fiber, each treated in five different ways before extraction with alcohol according to Conrad (*cf.* B.I.P.C. 15: 204). It is evident that the materials responsible for the increased wax values following treatment with hydrochloric acid are water soluble and are converted by the acid into a material that behaves like wax in the Conrad method and presumably in other wax methods. The nature of these substances is unknown. Cotton fibers should not be treated with hydrochloric acid prior to wax extraction; more correct values are obtained without such treatment. R.R.

DESICCANTS

LOVETT, ROGER A. New uses for desiccants. Modern Packaging 22, no. 5: 129-33 (January, 1949).

A discussion is presented of the Armed Forces' Method II for protective packaging and especially of the inert, odorless, tasteless, nontoxic, solid desiccant, Desiccite, which is being used extensively in siftproof containers for packaging with foods and pharmaceuticals and has the approval of the Food and Drug Administration for this purpose. Desiccite 25 is a pelleted form of montmorillonite desiccant which does not degenerate under extreme conditions and has a high bulk density, thus allowing the packaging of a greater weight of desiccant in a given volume. Factors to be considered in applying a desiccant to a specific packaging problem are discussed, including the moisture barrier to be used, the nature of the product to be protected, and the location of the desiccant within the package. Examples are given of various methods of applying a desiccant to protective packaging for confectionery, pharmaceuticals, dehydrated fruits and vegetables, and crisp bakery products. R.R.

DOCUMENTATION

HUNTRESS, ERNEST H. Methods for rapid location of data on organic compounds. Chem. Eng. News 27, no. 2: 76-80 (Jan. 10, 1949).

The relative merits of several different existing methods of listing organic compounds are discussed. The advantages of a comprehensive formula index as compared with a name index are presented. Attention is focused upon the necessity for substantial improvements in currently available means for the location of information regarding chemical compounds,

including the development of comprehensive, organized, and correlated compendia. E.S.

SMITH, JULIAN F. Documentation—Government and private. Chem. Eng. News 27, no. 2: 80-2 (Jan. 10, 1949).

The two primary purposes of documentation are to facilitate the prompt dissemination of live facts among interested persons and to systematize dead storage for ready reference of any wanted fact. Scientific literature—dating about three centuries back—poses a problem huge in bulk, intricate in complexity, and dual in character (production and utilization). The author gives a brief history of the development of documentation and discusses the current problem from both angles. On the production side, the output of scientific and technical literature has increased enormously in recent decades. With regard to the utilization side, the author reviews the present status of documentation work by libraries, societies, and Government agencies which is inadequate. The fact is emphasized that vast sums are being spent by Government and industries to build a huge and complex research structure; however, unless the money is provided to ensure the proper documentation of this accumulation of data, a large amount of the money will be wasted, because the results are unavailable. E.S.

DRYING

FRIEDMAN, SAMUEL J. Drying. Ind. Eng. Chem. 41, no. 1: 27-31 (January, 1949); *cf.* B.I.P.C. 18: 364.

The author reviews the literature on drying in general during the past year; two paragraphs are devoted to paper and board drying. 178 references. E.S.

KARPINSKI, JOHANN. Drying by means of hot air. Das Papier 2, no. 19/20: 364-71 (October, 1948). [In German]

All phases of drying by the use of hot air may be followed by means of a Mollier diagram, whereby the available heat and steam can also be shown graphically. All types of drying equipment which are not insulated against outer heat losses give rise to a high steam consumption. The heat from the outgoing air can only be utilized in a cycle when no moisture is carried along in the course of the heat transfer. The concomitant use of the outgoing air is required—even when there is no heat recovery—when the necessary air velocity (required for the evaporation of moisture from the material to be dried) cannot be attained by other means. L.E.W.

DRYING—PAPER

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. *Drying and Ventilating Committee.* Paper drying discussion. Tappi 32, no. 1: 52A, 54A, 56A (January, 1949).

A condensed report of the round-table discussion on paper drying is presented, which was held prior to the third Engineering Conference sponsored by TAPPI at Buffalo on October 25-28, 1948. The report is written in the form of questions and answers. E.S.

DYES AND DYEING

CRANK, J. The diffusion of direct dyes into cellulose. II. The interpretation of rate of dyeing measurements. J. Soc. Dyers

Colourists 64, no. 12: 386-93 (December, 1948); *cf.* B.I.P.C. 18: 668-9.

Earlier work on the measurement of the diffusion coefficient for direct dyes into a cellulose sheet is discussed. The variation of this coefficient with dye concentration is considered, and a suggestion is made for improving the accuracy of the results by adopting a different method of mathematical analysis. Some recently developed mathematical solutions of the diffusion equation for conditions corresponding to those of the commercial dyebath are shown to lead to calculated rate-of-dyeing curves which are not in agreement with experimental measurements. An interesting result obtained is that, for the cases examined, dyeing from a finite dyebath—e.g., one showing 90% exhaustion—is better represented by the mathematical solution for an infinite dyebath than by the solution actually corresponding to 90% exhaustion. An explanation is advanced in terms of the electrochemical nature of the system, an aspect of the problem which was previously neglected in deriving the mathematical solutions. Further experimental data are necessary before the explanation can be adequately tested. 14 references. E.S.

EUCALYPTUS

BOAS, I. H. Paper from hardwoods; the inner story of Australian experiments. World's Paper Trade Rev. 130, no. 24: 1568, 1570 (Dec. 9, 1948); *cf.* B.I.P.C. 19: 39.

Details of the development of the paper industry from hardwoods in Australia are given. In 1916, Mathey, Conservator of Forests from Dijon, France, was in Australia on a mission to get wartime timber and suggested to the author that he should try to make paper from eucalyptus, because some preliminary studies in Grenoble with *E. globulus* had seemed promising. The author who knew nothing of papermaking, experimented with home-made equipment and soon became convinced that paper could be made from eucalyptus, in spite of the report of a well-known American expert, who declared in 1914 to the Tasmanian Government that the species was useless for pulp. Early in the work, the author was joined by L. R. Benjamin who, after 1921, carried on the experimental work alone and to whom the major credit must be given for the technical success of the present paper industry in Australia. The steps from a laboratory digester to a ton-a-day plant and finally to full-scale production was a task which took nearly 20 years, the author's work being nowhere taken seriously and he himself being generally treated as a crank. After 1921, his main part consisted in pressing the idea in every quarter and taking part in the complex discussions which finally led to success. E.S.

EVAPORATION AND EVAPORATORS

BADGER, W. L., and LINDSAY, R. A. Evaporation. Ind. Eng. Chem. 41, no. 1: 32-4 (January, 1949); *cf.* B.I.P.C. 18: 365.

A review of recent literature on evaporation and evaporators is presented, most of the 44 references referring to the year 1947, although earlier and later ones are also included. E.S.

COATES, JESSE. Simplified method for estimating evaporator capacity and steam consumption. Chem. Eng. Progress 45, no. 1: 25-32 (January, 1949).

A method is presented for making a rapid estimate of the heat transfer area, capacity, and steam consumption of a multiple-effect evaporator. A number of equations are given and their application is illustrated by several ex-

amples. The accuracy of the method is sufficient for most engineering purposes and its use saves considerable time over that required for the usual method of solving multiple-effect evaporator problems. E.S.

FORDYCE, CHARLES R., and SIMONSEN, DAVID R. Cellulose ester solutions; evaporation in binary solvent mixtures. Ind. Eng. Chem. 41, no. 1: 104-11 (January, 1949).

Solutions of cellulose derivatives in mixtures of organic solvents are employed for a variety of technical applications. An understanding of the mechanism of evaporation of such solvent mixtures is important to proper control of properties of surface coatings. Measurements during evaporation of several binary solvent mixtures have been made and correlated with vapor pressures. Solvent mixtures in absence of cellulose derivatives have been found to evaporate primarily according to liquid-vapor equilibrium characteristics during exposure to ordinary atmospheric conditions. In the presence of cellulose esters evaporation in many cases deviates from this behavior, showing selective retention of certain types of solvents. E.S.

FEED WATER

GHOSE, M. K. Feed water and boiler scales. Indian Pulp and Paper 3, no. 4: 159-68 (October, 1948); *cf.* B.I.P.C. 19: 314.

This is the conclusion of the previous article. E.S.

FIBER—STRUCTURE

RITTER, GEORGE J. Microstructure of wood and wood fibers. Tappi 32, no. 1: 11-17; discussion: 17-20 (January, 1949).

The object of this paper is to indicate the phases of wood and fiber microstructure that should be considered in the light of current developments. The structure of wood and its various components are described in considerable detail. 14 figures and 26 references. E.S.

FLOCCULATION

MASON, S. G. The flocculation of cellulose fibre suspensions. Pulp Paper Mag. Can. 49, no. 13: 99-104 (December, 1948).

The most important factor involved in the flocculation of fibers is shear motion arising from circulation, agitation, or stirring. From simple considerations of the motion of cylindrical particles in a shear field, a mechanism of flocculation is outlined, which serves as the basis of an experimental approach to the study of this important problem. Experimental methods now being used at the Pulp and Paper Research Institute of Canada are briefly described (the principle of the pulse count method and the principle of the time-integration method), and some preliminary experimental data are given. A brief discussion of nonmechanical factors involved in the process (increase in temperature, addition of electrolytes and change of zeta potential, presence of air bubbles, effect of ultrasonic waves, etc.) is included. 7 figures and 14 references. E.S.

FOLDING BOXES

ANON. Expandable apple carton with elastic band. Modern Packaging 22, no. 5: 110 (January, 1949).

An illustrated description is given of a two-piece paperboard folding carton which sets up into a tray with expandable elastic sides, the purpose of which is to accommodate slightly varying sizes of apples in a snug box pack that

will prevent bruising movement. The box is set up on a simple jig which has four upright pins around the top of which a rubber band is stretched. The four walls of the carton are folded up, over the band, and down. The cartons can be set up at the rate of about 20 per minute. R.R.

ANON. Lock-tab for frozen foods. Modern Packaging 22, no. 5: 119-21 (January, 1949).

A description is given of a consumer-sized frozen-food carton and of the operation of the fully automatic equipment for forming and closing the package. The cold-waxed carton of white patent-coated 16-gage solid manila is set up and locked without glue to form a container ready for overwrapping. No liner is required when prefrozen vegetables are used. The box is said to be more rigid than its glued counterpart. The equipment, called Auto-Pack, consists of one machine to set up and move the cartons onto an endless conveyor system to be filled and another to close and lock the lids on the filled packages. The entire packing line requires about 35-40 feet. Operation speeds are regulated by the overwrapper, but the set-up equipment can be run at 80-85 cartons per minute. The major saving in the new equipment is in labor—only two inspectors are needed. The elimination of the gluing operation and extra handling involved therein results in an estimated 20-30% saving in the container cost; a further economy is effected in that the blanks are shipped and stored flat. R.R.

BALDWIN, CLARA. Swedish boxmaker has progressive policy, quality cartons. Am. Boxmaker 38, no. 1: 14-15 (January, 1949).

A brief summary is given of the organization of Esselte, a Swedish holding company controlling 67 container and printing concerns. At present, new package designs are limited by the scarcity of board and other necessary supplies. Some of the most effective packages are described and illustrated, including a lined folding carton with an attractive game bird design for cartridges, a lined coffee carton with closing units for protecting the contents after the seal is broken, and a flat open-end carton of sulfite paper with a liner of sulfate for saw blades. R.R.

FOLDING PAPER BOX ASSOCIATION OF AMERICA. What the apple wants. Modern Packaging 22, no. 5: 108-10 (January, 1949).

Through marketing tests conducted by the Association it has been found that apples packaged in transparent bags or folding window cartons outsell those in bulk by about three times when offered at the same price; with a price differential of almost 50%, the boxed fruit outsells the bulk by a 10 to 7 margin. There seems to be little difference between folding boxes and transparent bags in consumer preference. The value of refrigeration in the retail store is questionable; for any extended period of storage prior to display by the grocer, it is essential. Nonrefrigerated items fell to 50% salability after 21 days without packaging, but only to 70% with packaging. Because the two important points to be considered in packaging apples are protection and sales appeal, it is necessary that the boards be of sufficient caliper if boxes are used; large fruit requires at least 0.024 board. There should be a large cut out to give good visibility; the use of transparent film is not imperative, but if it is employed, it should be at least No. 300 cellophane or its equivalent in cellulose acetate. A waterproof adhesive is necessary when refrigeration is used. R.R.

FRAZIER, ALVIN H. They don't call it that—but eggs are prepackaged too! Paper Sales 9, no. 1: 13, 34, 36 (January, 1949).

Egg cartons are available as square or oblong, flat-bottom, molded pulp, and cushioned containers, each made to hold a dozen eggs. Where desired, the oblong carton can be perforated for easy division into two half-dozen cartons. The containers may be obtained with stock imprints or with special printed sales and advertising messages, although the latter are practical only for the largest retailers. The best markets for these cartons are grocery stores, delicatessens, meat markets, chicken farms which market their eggs, etc. Selling points include protection, customer good-will, convenience, economy, adaptability to mass displays, advertising value, and increase in unit volume per sale. R.R.

FOREST FIRES

KOROLEFF, A. Action needed to reduce our losses from forest fire. Pulp Paper Mag. Can. 49, no. 13: 119-20, 122, 124 (December, 1948).

The great losses because of Canadian forest fires are mainly the result of inadequate means of forest fire fighting. Of the factors contributing to the fires—predominance of coniferous species, large amounts of dead wood, heavy slash over large areas, lengthy periods of "bad fire weather," the great expanse of the forests, and the difficulty of access—some are intrinsic and others can be changed. Further progress is necessary in fire prevention and detection and increased appropriations are needed. Under adverse conditions, ground crews are definitely a failure. The main need is to find rapid and dependable means of forest fire suppression which can be depended on even under difficult conditions. The use of aircraft is indicated, and studies should be made of the possibilities of explosives, fire extinguishing chemicals, and water bombs by the National Research Council and the Defence Research Board. Brief mention is made of the work done in Russia and the United States. R.R.

FORESTS AND FORESTRY

ANON. Forest management in British Columbia. Western Pulp and Paper 1, no. 2: 20-1, 27; no. 3: 20-2; no. 4: 22-5 (September-November, 1948); 2, no. 1: 12-13, 29-31 (January, 1949).

Of the three articles in the series prepared by the editors of *Western Pulp and Paper,* the first gives a brief history of forest management in Sweden and a summary of the sustained yield program in British Columbia, with considerable emphasis on the major recommendations of the Sloan Report. In the second article, a discussion is given of the Forest Management Licenses Act which followed the Sloan Report in 1947, including the objections to the law and its provisions. The criticisms of the Act are further discussed in the third article. In "Forest management taxation problems," the fourth paper of the series, L. R. Andrews presents some of the problems which must be solved before any large number of existing private operators in the province can afford to sign up for a forest management license contract, stressing the problem of the federal tax policy in respect to setting up adequate reserves against the financial risks and physical hazards involved in the industry. R.R.

KENNY, E. T. A review of British Columbia's forests and forest products. Western Pulp and Paper 1, no. 2: 31-3 (September, 1948).

The value of B.C. forest production for 1947 was in excess of $282,000,000; the wood consumed was 4187 million board feet. Lumber, pulp and paper, shingles, boxes, and plywood all showed huge gains, with pulp and

paper reaching $57,145,678, a 37% increase over the previous year. Tabulated data are given on end-product values of newsprint and other papers for 1938-47. In 1947, 386,394 tons of pulp were used and an additional 201,546 tons were exported from the Province. The forestry situation is discussed, including the Forest Management Licences created by the Provincial Legislature in 1947, and the 1948 legislation regarding farm woodlots and the Forest Development Fund of $2,500,000 for constructing a road system to make forests more accessible. R.R.

ROBERTSON, W. Forestry—a profession. Pulp Paper Mag. Can. 49, no. 13: 126, 128, 130 (December, 1948).

Although forestry, defined as the scientific management of forests for the continuous production of goods and services, has been practised in Europe for 200 years, it was not until the beginning of this century that a few far-sighted people realized its importance to Canada. Forest management is divided into four fields: protection, silviculture, operation, and administration; each of these is subdivided into research and applied forestry. A discussion is presented of these divisions and some of the problems involved in forest protection against fire, insects and disease, in inventory and growth surveys, and working plans. R.R.

YOUNG, VERTREES. Southern pulpwood in perpetuity? Tappi 32, no. 1: 1-5 (January, 1949).

The problem of an adequate pulpwood supply is common to every pulp manufacturer. An indication of the problems and opportunities existing in the South are presented, together with suggestions for the development of an adequate forestry program. E.S.

GRASSES

SETH, B. D., BISWAS, B., and DHINGRA, D. R. Utilisation of kans in the manufacture of paper and allied products. Indian Pulp and Paper 3, no. 5: 199-202 (November, 1948).

The authors describe cooking experiments with "kans" (Savannah grass, *Saccharum spontaneum*); they obtained a 38.5% yield of unbleached pulp by digesting the grass with 8% sodium hydroxide and 4% sodium sulfide for three hours at a pressure of 60 p.s.i. Immersion in water for 48 hours at room temperature prior to digestion was found to remove a large percentage of water-soluble impurities. The paper made from grass harvested before it reached maturity was of a better quality than when fully ripened grass was employed. The strength of the paper could be increased by the addition of about 15-20% of pulp prepared from sunn hemp ropes. Cost data based on semicommercial experiments are included. 15 references. E.S.

HEAT

SKAPERDAS, GEORGE T. Heat transfer. Ind. Eng. Chem. 41, no. 1: 52-5 (January, 1949); *cf.* B.I.P.C. 18: 370.

The literature on drying during the past year is reviewed under the headings: boiling, condensation, convection, conduction, and miscellaneous. 58 references. E.S.

HEATING (INFRARED)

DÉRIBÉRÉ, MAURICE. The use of infrared in the paper industry. Bull. assoc. tech. ind. papetière 2, no. 8: 153-5 (December, 1948). [In French]

The drying of stereotyping cardboard, vellum, blotting, writing, coated, and flock papers is briefly discussed as well as the rapid drying of sheets prior to impregnation with Bakelite and after treatment with thermosetting and thermoplastic resins, by use of infrared lamps. Reference is made also to the drying of printing inks. L.E.W.

HISTORY

GENERAL PRINTING INK CORPORATION. The story of printing inks. Paper & Print 21, no. 4: 350, 352, 354 (Winter, 1948).

It may be that the beginnings of ink making are obscure because several centuries of trial and error were involved. The Chinese are known to have made inks several centuries before Christ, and to one of them, Wei Tang, is given the credit for making the first true ink from lampblack, the first "gleaming" ink, and the first scented ink. Ancient Chinese historians credit ink discoveries to 2698 B.C. The Bible mentions an ink used by the Hebrews, and the Arabians are known to have used a lampblack. Early Chinese ink formulas are given. Beginning with the Sung period, lampblack was obtained from petroleum. It is claimed that the Koreans perfected ink manufacture and gave their method to the Japanese, who improved the inks, paper manufacture, and printing. Chinese inks were a deep true black, permanent and shining, and kept well. Inks remained much the same until early Dutch and German painters discovered the value of boiled linseed oil. The fifteenth century printers began to formulate printing inks as they are known today for reproducing from movable type. Methods of manufacture are described. Early German manufacturers produced fine quality blacks from linseed oil and lampblack; early English makers added rosin and mineral oils. Caxton is credited with being the first printer to make his own ink in England, the date being 1476-77. When the danger and labor involved in making inks became too great for printers, they relegated the trouble to someone else; thus occurred the separation of the printing and ink making industries. In 1755, William Blackwell founded one of the first English establishments devoted exclusively to ink manufacture, after which the idea spread to other countries. During the Revolutionary War, American printers boiled fish oil instead of linseed oil. Some of the earliest American ink makers are listed. R.R.

INDICATORS AND TEST PAPERS

KOLTHOFF, I. M. Indicators. Anal. Chem. 21, no. 1: 101-3 (January, 1949).

The author discusses acid-base indicators, indicators for oxidation-reduction reactions and for iodometric titrations, and adsorption indicators. Data are tabulated on new acid-base indicators for aqueous solutions. 30 references. R.R.

INSTRUMENTATION

FRANKLIN, J. N. Instrumentation of the groundwood pulping process. Tappi 32, no. 1: 42-8 (January, 1949).

The author discusses present and possible future uses of instrumentation at each step of the groundwood pulping process, including all functions from log pond to machine. He points out what must be accomplished by such instrumentation in order that the equipment be not only justifiable, but strictly essential to efficient operation. E.S.

MURPHY, E. A. Instrumentation—a factor in achieving maximum chemical recovery. Southern Pulp Paper Manuf. 12, no. 1: 42, 44, 46 (January, 1949).

The recovery plant of an alkaline pulp mill offers an excellent example of the manner in which properly engineered instrumentation contributes toward the efficient operation of various closely integrated continuous processes. The author discusses the application of instruments to multiple-effect evaporators, disk evaporators, and the recovery furnace and dissolving tank. The need for co-operation between mill operators and instrumentation engineers and for the pooling of their knowledge and experiences is emphasized. Instrument manufacturers maintain staffs of skilled engineers schooled in the capabilities and limitations of the various types of instruments to solve specific industrial measurement and control problems. Mill operators should avail themselves of the services of these specialists who will save much valuable time and assure an appropriate and correctly installed system, which will fulfill the requirements of the process to which it is applied. E.S.

MURPHY, E. A. Temperature measuring systems. Paper Ind. 30, no. 9: 1342-6 (December, 1948).

The author gives a broad over-all picture of the advantages and limitations of the more important temperature-measuring systems, stressing the fact that there is no one type of system which can be said to be most economical or most practical for all mill processes. Each problem of temperature measurement or control should be considered separately and analyzed to determine the exact instrument requirements, such as the degree of sensitivity and accuracy required, range of temperature involved, distance of instrument from point of measurement, type of control, application to a batch or continuous process, etc. The following systems are discussed: pressure-type thermometers and—after brief consideration of the primary measuring elements, such as resistance thermometer bulbs, thermocouples, and radiation units—electrical temperature measuring instruments, including multivoltmeters and mechanically and electronically balanced potentiometers. Several types of electrical instruments are available as indicators or recorders and with pneumatic or electric control. The most satisfactory installations result from the joint planning of mill operators and experienced instrument engineers. E.S.

MURPHY, E. A., and SHOLL, H. A. Modern concepts of paper dryer control. Instrumentation 3, no. 5: 29-30 (October-December, 1948); Paper Mill News 72, no. 2: 18, 20 (Jan. 8, 1949).

The authors describe a complete system for the control of the important variables in a paper drier section, including a temperature controller, tachometer, Moist-O-Graph, pressure recorder, and flowmeter. E.S.

SHOLL, H. A., and ZIMMERMAN, G. D. Bleach plant instrumentation. Pulp Paper Mag. Can. 49, no. 13: 93-8 (December, 1948).

Although there is little attempt to standardize multistage bleaching plants, it is essential that all phases of the process be as continuous and automatic as possible if over-all mill operation is to be kept at maximum efficiency. It is here that adequate instrumentation plays an important part. Qualified instrumentation engineers should be consulted as to the instrumentation system best suited to the measurement and control problem of the plant in question. A description is given of an exemplary instrumentation system engineered for a four-stage bleaching plant handling washed brown stock. The types of instruments employed include a pH controller, liquid level recorders, flowmeters of the differential pressure and the variable area types, temperature recorders and controllers, and a tachometer for speed measurement and for

use as a stock or load meter on the washer. There is a definite trend toward the use of completely centralized master control cubicles which, designed especially for a specific bleach plant installation, can be supplied with all instruments and control accessories mounted, wired, and piped to simplify installation. Console type cubicles, located adjacent certain pieces of process equipment, are often used with the master cubicle. The console type is normally equipped with indicators operating in parallel with the recording controllers on the master unit and incorporate push-button switches, signal lights, and remote valve operating switches. Special consideration should be given to the selection of materials for thermometer bulbs, capillary tubing, wells, and sockets which are exposed to the corrosive action of many fluids used in the process. The importance of proper planning in working out the best instrumentation is emphasized. 12 figures. R.R.

IONS

KUNIN, ROBERT. Ion exchange. Anal. Chem. 21, no. 1: 87-96 (January, 1949).

Following a general survey of the use of ion exchange in analytical chemistry, the author discusses the basic principles, concentration of dilute solutions, the fractionation of ions having similar analytical properties, removal of interfering ions, miscellaneous analytical applications, and apparatus and techniques. 18 figures, 7 tables, and 54 references. R.R.

KUNIN, ROBERT. Ion exchange. Ind. Eng. Chem. 41, no. 1: 55-9 (January, 1949); *cf.* B.I.P.C. 18: 371.

The subject is reviewed under the headings: theory of ion exchange, water softening, deionization, separations and concentrations, laboratory applications, catalysis, biological applications, and new exchangers. 130 references, chiefly to the years 1947 and 1948. E.S.

JUTE

CORTEEN, H. The textile industries of eastern Scotland. Chemistry & Industry [68] no. 1: 3-6 (Jan. 1, 1949).

After briefly reviewing the history and development of the textile industries in eastern Scotland, the importance of the jute industry in these areas is pointed out. The origin of jute fiber, its chemical nature, the action of chemical reagents, physical properties, and applications are discussed. Jute cloths find their greatest use in the packaging industry (bags and sacks, canvas and ducks), but are also extensively employed in carpet and rug manufacture, as linoleum backing, for roofing felts, and electrical applications, such as fuses, cable braiding, cores of wire ropes, etc. E.S.

LIBRARIES

WHITFORD, R. H., and O'FARRELL, J. B. Use of a technical library. Mech. Eng. 70, no. 12: 987-93 (December, 1948).

Successful library research depends as much upon sensing which kind of publication is likely to yield the information sought as upon consulting appropriate aids and indexes. The authors outline suitable procedures for locating data in the various forms of technical literature, such as books, serials, journals, government publications (including patents), and trade catalogs; each type is described from the standpoint of subject material content and its availability through skillful use of bibliographical tools. In conclusion, the use of other libraries and services is discussed. E.S.

LIGNIN

ERDTMAN, HOLGER, and LEOPOLD, BENGT. Aromatic keto- and hydroxy-polyethers as lignin models. I. Acta Chem. Scand. 2, no. 5-6: 535-7 (1948). [In English]

Because hydroxyl groups disappear in the sulfonation of lignin, this reaction was studied with veratroylmethyl 2-methoxy-4-acetylphenyl ether (I) as starting material. (I) was reduced with aluminum isopropoxide to give β-hydroxy-β-(3,4-dimethoxyphenyl)ethyl 2-methoxy-4-(α-hydroxyethyl)phenyl ether which, when treated with bisulfite, gave the disulfonic acid in which the two α-hydroxyl groups have been replaced by two sulfonic acid groups. F.E.B.

RAFF, R. A. V. Lignins—their nature and applications. Can. Chem. Process Inds. 33, no. 1: 35-40 (January, 1949).

The position of lignin in the cell wall, its relation to cellulose, and its function in the living cell are not definitely known. It has not been found in *Thallophytes* and mosses, but occurs commonly in plant life from ferns up through the plant system. The author discusses the possible nature of protolignin or natural lignin as it occurs with cellulose in the cell walls of plants. Except for color reactions with phenols and amines, all investigations must be carried out on lignin separated from cellulose and the results can be applied to natural lignin only with reservations and caution. It is quite certain that natural lignins differ from one species to another and also vary according to the age of the plant in which they occur. Consideration is given to the methods of separating lignin and the modifications obtained in each case, to the structure of lignin and the structure and synthesis of the gymnosperm lignin of Russell, to biological considerations of lignin, the isolation of lignin as an unchanged product, lignin derivatives, lignin in the pulp industry, the use of soda and kraft lignins to develop the strength of GR-S rubber, and the use of hardwood-soda lignin (aspen) in the plastics industry. It is possible that, when a profitable use for lignin has been established, the present chemical pulping methods may be entirely changed, perhaps in favor of a continuous extraction process with organic solvents. These new and milder pulping methods may lead to better pulps in better yields and to the simultaneous recovery of other valuable constituents of wood, many of which are now burned or discarded as sewage. 5 figures. R.R.

ZAHN, H., and LAUTSCH, W. X-ray structure investigations of lignins. Kolloid-Z. 110, no. 2: 82-9 (August, 1948). [In German]

Various types of spruce and beech lignins and some of their tosylated, brominated, and detosylated derivatives, together with model substances obtained by the fermentative dehydration of ferulic acid, dihydroferulic acid, syringic acid, and allyl-3,5-dimethylpyrogallol (*cf.* Freudenberg and Richtzenhain, B.I.P.C. 14: 171) were subjected to x-ray investigations. The results did not allow far-reaching conclusions to be drawn with regard to the structure of lignin, because no interferences were found that indicate a periodicity in the direction of a combination of the lignin building stones by main valences. Therefore, some lignins, particularly spruce lignins, are considered to be amorphous, although beech lignin seems to be somewhat better orientated. This makes it possible to differentiate between the two types of lignin by x-ray studies. Beech lignin seems to possess a certain kind of chain structure, whereas spruce lignin has more of a layer structure—but even this is very poorly developed. The low degree of the orientation of lignin is not the result of a superposition of submicrocrystalline particles with amorphous fringe regions but is the result of a defective order. This is caused by the

lack of uniformity of the lignin molecule and by its complicated structure and is typical of the lignin as a whole. 21 footnotes. F.E.B.

MACHINERY

HODGE, E. A., JACKSON, P. ANDREW, and GOLDSMITH, P. H. Paper machine developments. Paper Mill News 72, no. 4: 24, 26-7, 29, 90 (Jan. 22, 1949); Paper Trade J. 128, no. 3: 13-17 (Jan. 20, 1949).

The authors discuss recent developments on Fourdrinier and cylinder machines including, among others, the Flow Spreader, the closed or pressure slice, the Rapi-drape Fourdinier, Stream-Flow vat systems, Simplex presses, and a new drier design, called Vitalized drier. E.S.

MACHINERY—CONVERTING MACHINERY

VICKERS-ARMSTRONGS, LTD. A distinctive wire stitcher. World's Paper Trade Rev. 130, no. 18: 1164 (Oct. 28, 1948).

Brief reference is made to the Empire folding box stitcher, a high-speed unit for the wire stitching of folding boxes and cartons. This model is available as a combined unit for rigid and folding box work, including anvil and clinching arrangements for rigid box stitching. The conversion from one type of work to the other takes only a few minutes. E.S.

MACHINERY—DANDY ROLLS

SINCLAIR, P. S. A dandy roll must be driven for best results. Paper Mill News 72, no. 1: 12, 17 (Jan. 1, 1949); *cf.* B.I.P.C. 17: 69.

The advantages of a driven dandy roll are outlined. E.S.

MACHINERY—DRIVE

GAHL, E. A. Variable V-belt drives for winders. Paper Ind. 30, no. 9: 1346-7 (December, 1948).

The advantages of V-belt drives with motor control sheaves are described for rapid and accurate small changes in differential speed between rolls of calenders, winders, and similar equipment. 3 figures. E.S.

MACHINERY—DRIVE, ELECTRIC

BARTLETT, GUY. Electrical and allied developments during 1948. Gen. Elec. Rev. 52, no. 1: 11-52 (January, 1949); *cf.* B.I.P.C. 18: 376.

In this general review of all phases of electrical developments during 1948, a brief section on p. 32 deals with "Paper." Reference to real speed regulation of sectional drives is made. E.S.

HARLAND ENGINEERING COMPANY, LTD. *Industrial Drives Department.* Harland sectional electric drives. World's Paper Trade Rev. 130, no. 21: 1371-2, 1374, 1376 (Nov. 18, 1948).

Recent developments in sectional drives are reviewed, with reference to the two Harland Interlocked drives installed on the two new newsprint machines

at Corner Brook and Powell River in Canada, both of which are designed for maximum speeds up to 2000 ft./min. 4 illustrations. E.S.

OSCARSON, G. L. Synchronous motors in paper mills. Paper Ind. 30, no. 9: 1348-50 (December, 1948).

Data, supplemented by illustrations, on h.p., speeds, and torques of typical motor installations in the pulp and paper industry are given, the industry providing for a wider variety of synchronous motor applications than any other. Many of these are low or medium, constant speed, normal torque applications. On certain drives, precisely controllable, variable speeds are required, which may be obtained by the use of variable speed magnetic drives and constant speed motors, synchronous motors being particularly suitable for magnetic drive operation. Different types of open, dripproof, splashproof, self-ventilated, and other motors are described and recommended for various mill applications. E.S.

MACHINERY—DRUBBER

AGRONIN, TONY. Handling of dry broke in paper mills. Paper Trade J. 128, no. 1: 15-19 (Jan. 6, 1949); Pulp & Paper 22, no. 13: 86, 88 (December, 1948); Paper Ind. 30, no. 9: 1382, 1384-5 (December, 1948).

The correct handling of broke at the lowest possible cost is becoming an important problem in most of the larger paper mills. At first an ordinary hollander and, later, a breaker beater were installed alongside the dry end of the paper machine for repulping the broke. As the machine tonnages increased, special designs were developed, particularly for high-speed newsprint machines. In 1941, the first Hydrapulpers were installed underneath the calenders in a Canadian newsprint mill; this installation was followed by many others in different paper and board mills and converting plants. In most cases these were continuous units, with the stock being pumped directly to the chests in the mill. Some supplementary means is usually required to get the pulp into a completely defibered state; the stock is generally pumped back to the jordan chest and rejordaned back into the machine chest. However, this additional jordan treatment slows up the stock and only small amounts of broke at a time can be metered into the regular stock. The installation of the recently developed Shartle Miami Stock Drubber (*cf.* B.I.P.C. 19: 167-8) between the broke pulper and the machine chest is recommended which, if correctly installed, will insure practically complete defibering without any change in fiber length. 11 figures. E.S.

MACHINERY—FELTS

HUYCK, F. C., & SONS, *Albany, N.Y.* Nylon in papermakers' felts. Kenwood Bull. no. 42: 1-17 (October, 1948); *cf.* B.I.P.C. 18: 714.

The properties of wool and nylon fibers are discussed, showing that they complement each other in many respects. A papermaker's felt is essentially a compromise of various qualities and each increase in any or some of these must necessarily result in a partial sacrifice of some other property. Nylon will add strength and wearing quality to wool-nylon combinations and its resistance to microbiological attack is particularly desirable; the felting quality of wool, on the other hand, is an essential factor in producing the necessary cushion, resilience, and stability from a size standpoint. Since nylon does not possess the ability to felt, combination felts may lack some of the cushion and resilience to be found in all-wool felts. The proper balance of the composite properties of both fibers offers a greater latitude for flexibility

in manipulation and adaptation for the many different types of papermaking conditions that exist throughout the industry. E.S.

MACHINERY—FILTERS

MILLER, SHELBY A. Filtration. Ind. Eng. Chem. 41, no. 1: 38-41 (January, 1949); *cf.* B.I.P.C. 18: 376.

A review of the literature for 1948 is presented, although some earlier references are also included. 72 references. E.S.

MACHINERY—GRINDERS

MAGRUDER, ROBERT S. The use of a Roberts grinder for manufacturing different grades of groundwood. Tappi 32, no. 1: 29-35 (January, 1949); Pulp Paper Mag. Can. 50, no. 1: 91-6 (January, 1949).

A short description of the Roberts grinder is given to familiarize the reader with construction features. A series of tests were run on commercially operating Roberts grinders to determine the operational characteristics for this type of grinder. The effect of stone surface age, power input (grinding pressure), grinding temperature, and burrs used on the dependent variables of production, power consumption, fiber classification, and strength are discussed. The application of this information to the manufacture of several grades of groundwood pulp is demonstrated. E.S.

MACHINERY—HEAD BOX

KUTTER, R. L. Controlled stock flow to the machine. Paper Trade J. 128, no. 1: 19-21 (Jan. 6, 1949); Pulp & Paper 22, no. 13: 86 (December, 1948); Paper Ind. 30, no. 9: 1390, 1392 (December, 1948).

The advantages of the Hydronamic inlet are described, which consists of two tapered ducts extending across the width of the machine, with the stock coming in at the large ends and flowing in opposite directions, but with a common slot orifice for the two tapered ducts. The stock velocity is the same at all points across the machine, thus enabling the inlet to discharge the uniformly distributed stock into the headbox or vat with a minimum of eddies. The travel of the stock through the slice or to the forming area of the cylinder mold should be as short as possible to prevent flocculation of the rather thoroughly deflocculated stock. The stock flowing onto the machine should also be de-aerated as completely as possible. Special metering valves are provided in place of the conventional regulating box with orifice gates from which the stock cascades into a pipe line leading to a pump suction; the absence of cascading of stock eliminates entrainment of air and contributes toward more uniform performance. A liquid level control instrument on Fourdrinier headboxes is capable of detecting very small variations in the head of such boxes. The latest installations have been equipped with a zero-speed instantaneous shut-off control, in case the Fourdrinier wire should stop for any reason. E.S.

MACHINERY—MIXING APPARATUS

RUSHTON, J. HENRY. Mixing. Ind. Eng. Chem. 41, no. 1: 61-4 (January, 1949).

The author reviews recent literature on the subject under the headings: agitator selection, influence of internal tank fittings, power characteristics of

mixing impellers, effect of tank baffles on mixing, heat transfer in mixing vessels, high-speed propellers as disintegrators, agitation in autoclaves, sampling and statistical measures, and air-lift agitator. 21 references. E.S.

MACHINERY—PACKAGING MACHINERY

ANON. Fully automatic line, utilizing existing equipment, revolutionizes production-packaging of ice cream sandwiches. Packaging Parade 17, no. 192: 66-7 (January, 1949).

Part of a recently installed ice cream sandwich production line is a Sutherland Paper Co. Kliklok type LF machine which sets up a square tray from a flat die-cut blank. The sandwiches are automatically built up in the trays, which keep the contents in shape before they are frozen and also keep them untouched by hands during the manual bagging process which precedes freezing. R.R.

MACHINERY—PAPER MACHINE

ANON. First new post-war paper machine in British mill. World's Paper Trade Rev. 131, no. 1: 1-2, 42 (Jan. 6, 1949).

The first new paper machine in Great Britain built and installed in the country after the war is a new M.G. machine at the Darwen mills of the New Waterside Paper Mill Co., Ltd. The main portion of the machine was built by Bertrams Ltd., Sciennes; on account of the acute delivery position, it was not possible to give the complete order to one individual firm. The machine will make paper up to 90 inches wide and has a speed range from 50-500 ft./min. It has been designed to produce up to 120 tons of M.G. envelope papers weekly. E.S.

MACHINERY—PRINTING MACHINE

ANON. New colour printing machine for transparent cellulose films and metallic foils. Brit. Packer 10, no. 12: 19 (December, 1948).

An illustrated description is given of the new Thrissell gravure press for films and foils. The machine was designed to have the shortest possible paper line with maximum drying effect and minimum heat, enclosed ink ducts, and strong printing units to ensure sufficient pressure for printing solids on rough-faced materials as well as films and foils, and to operate easily with quick change-overs for dealing with comparatively short runs. R.R.

MACHINERY—SCREENS

EDWARDS, JOSEPH. Screening groundwood pulp. Tappi 32, no. 1: 36-8 (January, 1949).

Some general principles covering coarse and fine screening of groundwood pulps are reviewed briefly and, in the latter case, an attempt is made to draw a clear distinction between the requirements of primary screens and re-screens. The influence of consistency on the efficiency of the combined screening and deckering operation is discussed at length and illustrated by the description of the Cowan screen systems recently installed in the two newsprint mills of Price Brothers & Co., Ltd., at Riverbend and Kenogami. E.S.

WURZ, OTTO. Fine screening of halfstuff and whole stuff in the paper industry. Textil-Rundschau 3, no. 10: 352-5 (October, 1948). [In German]

Supplemented by several illustrations, the operating principles of the Erkensator, the Bird Centrifiner, and the Vortrap for removing the impurties from fine-paper furnishes are outlined. E.S.

MACHINERY—SLITTERS AND WINDERS

LANGSTON, SAMUEL M., COMPANY, *Camden, N. J.* Langston redesigns "DA" slitters and winders. Shears 66, no. 672: 38 (December, 1948); Paper Mill News 72, no. 1: 23 (Jan. 1, 1949).

The redesigned "DA" slitters and winders have completely enclosed gear drives for the main drive and a pressure roll drive consisting of "nitrided" helical gears running in oil. Box-section frames and castings add to the ruggedness of construction and to the appearance of the machinery. The well-known "shear-cut" principle has been further improved by the use of a newly designed friction-driven front slitter operating in conjunction with a power-driven rear slitter, which results in clean-cut dust-free rolls. Machines are available with various types of drives, in any width from 82 inches up, and to rewind diameters up to 72 inches. Illustrations are included. R.R.

MATERIALS HANDLING

ANON. Loading Hydrapulper with Stephens-Adamson conveyor. Paper Mill News 72, no. 4: 37, 39 (Jan. 22, 1949).

The use of a Stephens-Adamson pan conveyor for the rapid charging of a batch-operated Hydrapulper with 6000 pounds of waste paper is outlined. By means of a large water supply tank and the conveyor, the pulper can be loaded in two minutes and be back in operation; previously, it was down for as long as 25 to 30 minutes between two different batches. E.S.

ANON. Palletizing raw material handling in a pulp and paper mill. Paper Mill News 72, no. 4: 38-9 (Jan. 22, 1949).

The changeover from handling wet pulp laps by manpower to palletizing and fork-truck loading by the E. B. Eddy Co. is described, including the preliminary survey with the aid of a material-handling consultant, the selection of equipment most suitable for the operations involved, and the careful planning of the actual changeover to avoid confusion and win the acceptance of supervisors and men directly concerned. The palletization system has now been extended to include other materials, such as alum, starch, dyestuffs, and paper rolls. E.S.

ANON. Why use a conveyor. Paper Mill News 72, no. 4: 42, 44 (Jan. 22, 1949).

The advantages of conveyors for charging continuous or batch Hydrapulpers are outlined; where building conditions do not permit the use of a long conveyor, skip hoist loaders have proved satisfactory, although they are less efficient than conveyors. E.S.

LOBERG, HARRY J. Training engineers to help solve materials handling problems. Paper Mill News 72, no. 4: 58, 60 (Jan. 22, 1949); Industry and Power 56, no. 2: 84-5 (February, 1949).

The author gives an outline of the essential elements required to train engineers to help solve materials handling problems, including elements of work simplification, plant layout as related to the flow of material, materials handling equipment, aspects of production control, financial economy in-

volved, and elements of cost accounting. Each of these fundamentals is considered briefly to show the need in the training program. E.S.

PUTNAM, D. H. Modern materials handling methods will boost production and cut costs. Paper Mill News 72, no. 4: 52, 54 (Jan. 22, 1949).

The author outlines the advantages of the Diesel-electric switching locomotive in the place of the usual steam locomotive for hauling heavy equipment and materials around the yards. E.S.

WILLARD, JOHN A. Economics of wood handling. Tappi 32, no. 1: 6-10 (January, 1949).

This paper deals with the problems of wood handling and the part that mechanization can play in them. The author, from his observations of wood-handling operations in Sweden a year ago, contrasts methods in that country with those in effect here. Throughout the paper emphasis is laid on the importance of knowing costs as the first step toward reducing them. This applies to the wood wherever it is handled, in the woods, en route, or in the yard. Various ways of handling wood are discussed, with reference to the differences in method between the North and the South. It is strongly urged that handling methods and equipment be selected only after careful study and on the basis of preplanning of operating costs. A cost formula is included for guidance. E.S.

WRIGHT, ROBERT E. Materials handling. Ind. Eng. Chem. 41, no. 1: 59-61 (January, 1949); *cf.* B.I.P.C. 18: 379.

Recent developments are reviewed under the headings: liquid and gas handling, solids handling, miscellaneous materials handling devices, and materials handling expositions. 19 references. E.S.

MATERIALS OF CONSTRUCTION

DONWORTH, R. B. Station design and material composition as factors in boiler corrosion. Paper Trade J. 127, no. 27: 17-20 (Dec. 30, 1948).

The equipment in a modern power station is composed chiefly of two elements, iron and copper. Other elements, including zinc, chromium, molybdenum, nickel, manganese, tungsten, cobalt, tin, phosphorus, antimony, arsenic, silver, and carbon, are also present in smaller quantities, and they are used principally for alloying purposes in order to obtain certain advantages not possible with the simple elements. The purpose of the present article is to show the relationship of the materials and the influence of design on both corrosion and erosion and the subsequent carrying of the products into the boiler. The effects of such products in the boiler will be discussed in other papers. 7 diagrams. E.S.

MICROBIOLOGICAL TESTING

LUCKIESH, MATTHEW, TAYLOR, A. H., and KNOWLES, THOMAS. Sampling devices for determining the bacterial content of air. Rev. Sci. Instruments 20, no. 1: 73-7 (January, 1949).

Air samplers for measuring the contamination by micro-organisms may be roughly divided into bubbler and impinger types. In the bubbler type, a definite quantity of air, with or without atomization, is bubbled through

water, thus collecting a large part of the organisms. In the impinger types, the organisms are deposited on the culture medium either by use of high linear velocity of the air or by application of an electrostatic field. The authors have developed two types of impinger samplers. One of these, weighing approximately 12 pounds, employs an electrostatic field of about 7000 volts. It can be used wherever 110 to 120-volt, 60-cycle current is available. The other sampler, called a duplex radial-jet air sampler, uses a high velocity air flow to impinge the organisms on the culture medium. Examples of the use of the latter sampler in important laboratory studies are described and typical experimental results are presented. 9 figures. E.S.

MICROSCOPY

JELLEY, EDWIN E. Light microscopy. Anal. Chem. 21, no. 1: 40-4 (January, 1949).

Following a summary of recently developed techniques in light microscopy, the author considers transmitted light, reflecting microscopes, incident light, dark-field illumination, phase contrast, interference, fluorescence and phosphorescence, ultraviolet, infrared, and crystallographic microscopy, miscellaneous methods and applications, and resinography. 150 references, beginning with 1941. R.R.

MICROSCOPY (ELECTRON)

BURTON, CHARLES J. Electron microscopy. Anal. Chem. 21, no. 1: 36-40 (January, 1949).

The author discusses electron microscopes and the technique of their use as developed abroad and in this country, specimen preparation, electron microscope utilization, and electron diffraction, reviewing the pertinent literature from 1943 to the present. 159 references. R.R.

MILL MANAGEMENT

COOL, O. C. Improving workers' morale through attitude testing. Paper Ind. 30, no. 9: 1347, 1350 (December, 1948).

The author shows the advantages to be gained by an organization through attitude testing of their workers. Today, when so much money is being spent on industrial relations activities, some employers are beginning to conduct surveys to find out whether their efforts are effective. An example of questions asked in such a survey is given and an indication of the beneficial results derived from it. Since the problems are never exactly alike for any two companies, each survey must be made to fit the individual needs. A brief outline is given of the steps that should be taken before such a survey is conducted. If the information on which the survey is based is obtained in confidence, it is absolutely essential that it be treated so by the employer. E.S.

MOLDED PULP ARTICLES

BRIDGER, R. O., and Co., LTD., *London.* Moulded paper cones for loud speakers. World's Paper Trade Rev. 130, no. 18: 1160, 1162 (Oct. 28, 1948).

Reference is made to molded cones from 3 to 18 inches in diameter for car radios up to the large public address speakers. After being formed to the exact size and shape in the blank form, the cones are put under pressure on heated tools conforming to the exact dimensions, then doped for waterproofing to withstand the humidity of the atmosphere and again blocked, and

finally dipped for hardening as required. Exact tone reproduction is often obtained by the addition of one or more corrugations running in circles around the cone and placed in different positions to obtain different results. Sometimes the thickness of the cone is varied in the sides from the neck downward. The weight or substance of the cone also has a bearing on the reproduction and very close limits of weight must be observed. E.S.

NEWSPRINT

BROWN, CLARENCE J., and others. Select Committee on Newsprint and Paper Supply. Final report. Paper Trade J. 128, no. 2: 16, 56, 58, 60-2 (Jan. 13, 1949).

The objectives and activities of the Committee are reviewed, including data on the newsprint and paper supply situation, increased use of newsprint, newsprint prices, other paper and paper supplies, and the future of the paper industry in the United States and Canada. E.S.

PAPER—FILLERS

BHARGAVA, M. P., and SINGH, CHATTAR. A comparative study of some Indian china clays as paper fillers. Utilisation (New series), Indian Forest Bull. no. 134, 1942. Dehra Dun, Forest Research Institute, 1947. 9 p.

Prior to 1925, all Indian paper mills were using imported china clays exclusively, because the quality of the domestic clays was not up to the standard of mill requirements. Soon after this date, domestic production was developed and improved to such an extent that, by 1935, practically all imports had been discontinued and the Indian mills used the domestic product. In the present bulletin, the authors give an account of a comparison—from a papermaking viewpoint—of some Indian specimens and an imported sample of English china clay. The results are presented in tables and diagrams; they show that, in fineness of particle size and plasticity, the Indian samples tested were inferior to the English specimen. However, as far as the important properties of color, percentage retention in paper, and strength properties of the loaded papers are concerned, the domestic clays compared favorably with the imported product. Indian china clays can, therefore, be considered suitable fillers for the manufacture of paper and board. E.S.

PAPER AND PULP INDUSTRY

ANON. Champion Paper. Fortune 39, no. 1: 80-5, 140, 142, 144, 146 (January, 1949); Paper Mill News 72, no. 3: 8, 10 (Jan. 15, 1949).

An interesting analysis of the economic background of the pulp and paper industry is presented. The major and, in some respects, irreconcilable split in the paper industry is represented by two main types of organization, the partly or wholly integrated (46% of U. S. capacity) and the nonintegrated (54% of U. S. capacity) organization. The history and development of The Champion Paper & Fibre Co. of Hamilton, Ohio, with two other mills in Canton, N. C., and Houston, Texas, is given as an example of the policies followed by an integrated mill and its problems. The emphasis in the expansion program of this particular company was based on the economy and security of integration; no new pulp mill was built, although the capacity of the three mills has been increased by 50%. Its main accent was on the acquisition of additional timberlands. Arguments are presented for and against the two types of organization in the light of their future problems

when the old competitive struggle will be resumed. The review does not propose to give an answer. E.S.

BALLANTINE, A. C. Pulp and paper potentials of Alberta. Western Pulp and Paper 1, no. 2: 22-4 (September, 1948).

Until 1948, Alberta's participation in the pulp and paper industry was confined chiefly to marketing fire-killed timber. It is now realized that the resources of the Province in timber, hydroelectric power, waterways, natural gas, and coal near plant sites make it important to the industry, particularly so in view of the world paper shortage. It is estimated that the Province has approximately 130,620 sq. mi. of forest land, almost 70% of which belongs to conifers. Coal reserves are estimated at 46.5 billion tons. Hydroelectric power is at present distributed only by Calgary Electric, which has five power plants producing 105,000 horsepower. The great waterways of the Province are briefly traced. Natural gas is available almost anywhere. The cost to a fairly large consumer might average 18 cents/1000 cu. ft., comparable to a price of $3.96/ton of coal. Alberta is the second largest oilfield in the British Empire, with 541 wells operating in August, 1948. R.R.

CANADIAN PULP AND PAPER ASSOCIATION. *Western Branch.* Importance of scientific harvesting. Western Pulp and Paper 1, no. 1: 12-15 (August, 1948).

An investment of $19,000 for each of the 6500 mill employes of the B.C. paper and pulp industry and the inherent stability of the industry in contrast to the wild fluctuations of the steel and automotive industries, for example, demand that conservation be a constant and fixed objective in both forest and mill operations. About 10% of the entire annual log cut of the Province is used and processed by the industry, yet in 1947 it was responsible for over 32% of the annual income of the Province. The specific qualities of logs required by the industry, the methods of pulping, the logging salvage problem, research done in that field, and the basic principles of such salvage are considered. R.R.

GOOCH, W. L. Pulp and paper making in Korea. Southern Pulp Paper Manuf. 11, no. 10A: 66, 68, 70-1 (Oct. 31, 1948).

At least 90% of Korea's pulpmaking capacity is located near the pine forests of North Korea, whereas South Korea, with double the population, has only small nonintegrated paper mills normally dependent for raw material on northern wood pulp. In the 1930's, Japan initiated the manufacture of pulp and paper in North Korea on an expanding scale. In 1938, the annual production was 38,000 tons of wood pulp and 8300 tons of paper, the surplus pulp and most of the paper going chiefly to Japan. Beginning in 1939, Japan followed a program of moving a number of paper mills to Korea. About 13 were transferred to South, and others to North Korea. Production per mill varied from 30 to 80 tons per month and was concentrated on a general utility grade. One of the plants thus established is the Puksun Paper Co. at Kunsan, South Korea, the only modern mill in that part of the country. It is equipped with one Beloit Iron Works and one Black-Clawson machine and has a potential production capacity of 750 tons of newsprint per month. The company is now being reorganized to make the ownership entirely Korean. Today, the Korean industry is functioning under the handicaps of shortages of raw materials, mechanical replacement parts, electric power, and coal. Korean handmade papers are in wide demand because of their special properties, particularly strength and durability.

The fiber used is the inner bark of the paper mulberry; the equipment is primitive, having changed but little in hundreds of years. A description is given of the process of manufacture. R.R.

JOHNSON, H. WYATT. Touring Europe's mills: France—Italy—Belgium—Finland. Pulp & Paper 23, no. 1: 31, 94-5 (January, 1949); Pulp Paper Mag. Can. 49, no. 13: 78-81 (December, 1948).

The author presents his observations on the French, Italian, Belgium, and Finnish pulp and paper industry and on general conditions in each of these countries and in England. R.R.

POULIOT, L. J. New records again set in 1947 by Canada's pulp and paper industry. Pulp Paper Mag. Can. 49, no. 13: 82-9 (December, 1948); *cf.* B.I.P.C. 18: 382-3.

Statistics are presented from the annual statement by the Department of Trade and Commerce, Dominion Bureau of Statistics, Census of Industry, Forest Products Statistics for 1947. The gross value of products reached $706,971,628 for the eighth consecutive year of increases in the industry. The gross value of products was 33.9% and the net value 37.9% greater than in 1946, in which year the industry was first in gross value of products. In 1947, 115 mills were in operation, two more than in the previous year. Of this number, 88 produced 7,253,671 tons of pulp, an increase of 9.7%. Combined pulp and paper mills produced 72.4% of the total pulp for their own use, 6.7% more than in 1946. Over 23% of the total was exported, and about 4% sold in Canada. Groundwood pulp accounted for 58.9% of the total, unbleached sulfite 18.2%, bleached sulfite 9.7%, and sulfate 9.5%. The 86 paper mills produced 5,775,082 tons of paper and board, an 8% increase over 1946. Newsprint accounted for 77.5% of the total, an increase of 7.5%. Quebec led in both pulp and paper production, which were 51.7% and 53.7%, respectively, of the total, followed by Ontario, with 29% and 30%, respectively. The total value of materials used in the manufacture of wood pulp was $231,668,229, including 9,668,091 cords of pulpwood; the corresponding figure for paper is $265,934,944, including 5,585,061 tons of wood pulp. The average number of employees in the industry increased by 11.1% over 1946. The apparent total pulpwood production was 11,484,522 rough cords, a 9.1% increase. About 83% was used by Canadian mills, and the remainder, 1,698,712 tons, exported. Exports of paper were chiefly newsprint (4,220,779 tons). Tables are given covering statistics by provinces, changes in gross and net production values for 1929 to 1947, wood pulp and paper production, paper and paper goods imported, exports and imports of wood pulp, pulpwood used by each process, chemicals, etc., used in the manufacture of pulp and of paper, and exports of paper goods. R.R.

SMITH, VINCENT S. Paper: the lean years. Paper Making and Paper Selling 67, no. 3: 23-5 (Autumn, 1948); Paper Ind. 30, no. 9: 1339-41 (December, 1948).

The author presents a general survey of world supply and demand from the British viewpoint to contradict by facts the opinion, occasionally expressed, that more paper is now being produced than is required. It would rather appear that what is happening in Great Britain at present is that more paper and board is being produced than the Control will grant, which is an entirely different aspect of the subject. Examples of conditions and the demand for paper in various parts of the world are given. E.S.

PAPER AND PULP INDUSTRY—MUSEUMS

ANON. The historical paper collections of Dr. Weiss in Erfurt. Neue deutsche Papier-Ztg. 2, no. 22: 705-6 (Nov. 30, 1948). [In German]

Reference is made to the activities of Karl Theodor Weiss as a collector and research worker in the field of watermarks and related items. While still at school, he started collecting watermarks as a hobby. This developed into a systematic study and collection of old ream wrappers, papermakers' crests, genealogical data, pictures of papermakers, history of paper mills, technical equipment, molds, etc. The collections (German paper museum) were later transferred to Erfurt, where his son, Wisso Weiss, is continuing the studies of his father. K. T. Weiss died in 1945 at the age of 73. During the last year of his life, his eyesight had been impaired to such an extent that he could neither read nor draw. He shared the fate of another research worker in the field of watermarks, Briquet, who lost his eyesight completely on account of overstraining his eyes during the examination of the thousands of specimens involved. E.S.

GOY, OTTO. A German paper museum. Paper Trade J. 127, no. 27: 27 (Dec. 30, 1948); *cf.* B.I.P.C. 9: 83-4.

The activities of the German paper museum are outlined; the collections are now housed in the municipal library of Mainz. E.S.

PAPER AND PULP INDUSTRY—TRANSPORTATION

DONNELLEY, ELLIOTT. Reducing paper damage in transit. Paper Trade J. 128, no. 1: 50-3 (Jan. 6, 1949).

The author reports a systematic investigation carried out in a Chicago printing plant which dealt with damage studies on paper in rolls only, because the amount of flat stock used in this particular establishment is small compared with the roll stock. The loss sources were broken down into wrapping waste, railroad damage, plant damage, concealed damage, defective stock, core waste, makeready, and running waste. The plant used over 447 million pounds of paper in 1947; the railroad damage was 4,319,000 pounds, corresponding to a value of $431,806 (actual and concealed damage). The author and co-workers visited over 20 paper mills from which the company purchases its roll stock and watched each step in the handling of a roll of paper from the time it comes off the paper machine to the time it goes on the printing press. At each mill close track was kept of the rolls from wrapping through carloading, with complete records of each phase; when the rolls arrived in Chicago, a close check was made of how the rolls had ridden in transit, how they were unloaded, what damage had occurred to them, and in what condition they arrived at the presses. In order to obtain some worthwhile comparisons, the mills were asked to make two different types of shipments—one in their standard way in any car which they considered satisfactory, and the other in cars handpicked by the author and loaded according to the method found to give the best results. In the first case, the damage was as usual; in the second, it was reduced about 50%. The suggestions for improved shipments covered the use of commodity-inspected cars, swept and cleaned before loading, lined with wood stripping, the floor covered with chipboard, and four metal-wrapped bands, each 1¼ inch wide, across each doorway. Directions for loading rolls on their side and on end are also given; under no conditions should rolls be loaded on their side on top of rolls on end, although this is against O.D.T. rulings. The railroads are urged to get

this ruling changed, as they will lose more revenue in damage claims than can be gained by the increased tonnage. An example is included of a tabulated company report for the period April-September, 1948, of cars received where damage occurred; the damage is broken down into: cut on account of shifting, no apparent cause, chafed, wet stock, jammed in doorway, cut on nail, cut on bolt, puncture, band cut, cut on floor, cut on door post, cut on bracing, cut on plate, cut on toe block, cut on wall, riding on foreign matter, foreign matter in roll, oil soaked, flat core, and telescoped. The number of cars shipped from each mill and the name of the mill are given also. According to this tabulation, the greatest loss was caused by chafing, involving 205,920 pounds of paper of a total of 875,482 pounds damaged by the railroads. The author considers rough handling, including humping of the loaded cars in transit, one of the main causes of this damage. He admits that handling in the printing plant is not above criticism; however, strenuous efforts are being made to correct bad practices. Frequent reference is made to the important economic significance of these losses. E.S.

PAPER AND PULP MILLS

ABITIBI POWER & PAPER CO. Abitibi's new plants. Pulp & Paper 23, no. 1: 55-6 (January, 1949).

A summary is given of additions and improvements recently made at Abitibi mills, particularly the Thunder Bay mill, Port Arthur, Ont., which has a completely new grinder room with five lines of Waterous magazine grinders (*cf.* also Pulp Paper Mag. Can. 49, no. 13: 162-4, 166 [December, 1948]). The total newsprint capacity of the company at the end of 1948 was 648,000 tons; 96,000 tons of bleached sulfite pulp, 6200 tons of unbleached sulfite pulp, 46,000 tons of board, and 63,500 tons of fine papers were also produced. R.R.

EVANS, ROBERT H. Brazilian paper mill. Pulp & Paper 23, no. 1: 48, 50, 52 (January, 1949).

A report is given of the industry in Brazil and especially of the Cia. Agricola e Industrial Cicero Prado in Sao Paulo State, which the author visited in 1948. The country's paper industry has passed the postwar peak, with a consequent reduction in prices—which are still higher than in the United States—and curtailment in operations. The industry is largely nonintegrated. Adequate stands of Parana pine, which seems well suited for pulp production, give promise of supporting a considerable pulp industry in the southern part of the country. Cia. Agricola e Industrial Cicero Prado is both a rice and paper producer, the utilization of rice straw for cardboard marking the firm's entry into the paper field. The paper mill, which employs about 1100, can manufacture or assemble many fairly complicated machine parts in its own shops. Raw materials used include rice straw, domestic eucalyptus, and pine groundwood, and imported chemical pulp. Two grinders and four wet machines have a daily capacity of 80 tons. The mill has four paper machines producing cardboard, glassine, greaseproof, vegetable parchment, and parchmentized bond. Before the war, alpha-cellulose was also manufactured. With an annual production of 10,000 tons of paper and board, the mill is the third largest producer in the country. R.R.

MITCHELL, A. HARRIS. Westminster Paper Co. specializes in tissues. Western Pulp and Paper 1, no. 2: 12-16 (September, 1948).

Beginning in 1922 with one 132-inch straight Yankee machine, two creping machines, and a minimum of converting equipment, the Westminster Paper Co. now has two modern paper machines and the most up-to-date converting equipment. It produces over 20,000 tons of various tissues, with a total daily output of 75 tons. Much of the bleached and unbleached sulfite pulp is obtained from the Woodfibre and Powell River plants; groundwood pulp is supplied by the company's new mill, which uses waste slab trim and waste cores. The manufacture of toilet tissue, waxed paper, and facial tissue is briefly considered and some of the equipment is illustrated. R.R.

OSTROWSKI, HENRY J. Ocean Falls produces widest variety of papers in Canada. Western Pulp and Paper 2, no. 1: 16-20 (January, 1949); *cf.* B.I.P.C. 19: 332.

In 1918, the first full year of operation, the mill at Ocean Falls produced a total of 57,000 tons of newsprint and specialty papers. The 1948 production is estimated at 159,500 tons of newsprint, specialty papers, and kraft and sulfite pulp. Annual consumption includes some 120 million board feet of timber, 3160 tons salt cake, 3750 tons sulfur, 22,900 tons lime rock, 110 tons chlorine, and 347,000 barrels fuel oil. An illustrated description is given of the manufacturing processes and of the equipment involved. R.R.

STEPHENSON, J. NEWELL. The pulp mills of British Columbia. Pulp Paper Mag. Can. 49, no. 13: 72-7 (December, 1948); *cf.* B.I.P.C. 19: 27.

A brief illustrated description is given of the changes in the mills of the British Columbia Pulp and Paper Co. Ltd. at Woodfibre and Port Alice, B.C., and of the towns themselves. The slab-barking unit in use at Woodfibre is to be moved to Port Alice to replace the disk-type hand barkers. Other plans for the latter plant include the building of a Bellingham-type round-log barker and the installation of a whole log chipper to handle logs up to 42 inches in diameter, a Combustion Engineering 185,000 lb./hr. boiler, and two new Elliot turbines. The Sorg Paper Co. is making progress on its modernization program of the Port Mellon mill, which is illustrated. New installations include a Combustion Engineering chemical recovery furnace, a Westinghouse generator turbine, a Dunbar horizontal chipper, and a Swenson-Nyman pulp washer. Brief mention is made of the new 200-ton sulfate mill of Bloedel, Stewart & Welch at Port Alberni, the 200-ton bleached sulfate mill being erected at Nanaimo for the Nanaimo Sulphate Pulp Co., and the Columbia Cellulose Co. mill near Prince Rupert, which is to be the most northern mill in Canada. R.R.

PAPER AS A TEXTILE MATERIAL

PENNENKAMP, OTTO. Conversion and dyeing of paper yarns and products made therefrom. Neue deutsche Papier-Ztg. 2, no. 23: 744-5 (Dec. 15, 1948). [In German]

Different methods for dyeing paper yarn or fabrics, including froth dyeing, are outlined. Directions are also given for the calendering, stiffening, lustering, sizing, impregnating, and high-gloss lacquering of such yarns, or fabrics, ribbons, and products made therefrom. E.S.

PENNENKAMP [OTTO]. Requirements for spinning papers. Neue deutsche Papier-Ztg. 21, no. 2: 666 (Nov. 15, 1948). [In German]

With brief reference to the converting procedures to which the paper strips are subjected upon the spinning machines, the following properties are considered essential for a satisfactory material. The pulp—whether sulfite or sulfate—must be free of splinters and contain a sufficient amount of resinous substances and long and flexible fibers. The spinning paper must be uniform and well felted, strong, tough, and flexible, and completely lacking in cloudy, loose, and nonuniform formations. It must have sufficient wet strength and good absorptivity; sizing agents, if employed, must not impair other properties, the flexibility in particular. High breaking lengths are essential; values of 10,000-12,000 m. are quite usual. The basis weight is generally between 20-50 g./sq. m. The density of the paper must be uniform throughout, and no defects, such as folds in any direction, should be present. The moisture content should not exceed 8%. The spots where the webs are joined by adhesives should be clearly indicated. Directions for packing and shipping are also given. E.S.

PAPER MANUFACTURE

PAPER SALES. Paper making—Part V: The paper making machine. Paper Sales 9, no. 1: 18-19, 43-5 (January, 1949); *cf.* B.I.P.C. 19: 334.

A description is given of the changes the stock undergoes as it passes through the paper machine, and the differences between cylinder and Fourdrinier machines are explained. Illustrations and a diagram supplement the text. R.R.

PAPER SIZING

HERCULES POWDER COMPANY. The Hercules automatic emulsifying process for rosin size. Paper-Maker [U. S.] 18, no. 1: 17-20 (1949); Chem. Eng. News 27, no. 2: 106 (Jan. 10, 1949); Paper Trade J. 128, no. 1:42 (Jan. 6, 1949); Paper Ind. 30, no. 10: 1453-4 (January, 1949); Chem. Processing Preview 12, no. 2: 82-3 (February, 1949).

Reference is made to a process for the automatic emulsification of rosin size, utilizing a triplex unit consisting of three properly sized proportioning pumps for size, hot water, and cold water, respectively, driven by a single motor. This makes it possible to deliver at definite predetermined rates the three components necessary for the proper emulsification of the size. The paste rosin size flows from a storage tank through a heat exchanger to the rosin size pump of the unit; the hot size is pumped to an emulsifying unit where it is combined with a stream of hot water to form the primary emulsion. This flows through a turbine mixer to a small storage tank (with a capacity of four to six hours' mill supply) where it is diluted to its final concentration with cold water from the third pump of the triplex unit. When properly installed, the only labor required for the automatic process is the preventive maintenance customary for this type of mechanical equipment. E.S.

PAPER SPECIALTIES

ANON. Anti-rust and anti-tarnish tissue. Paper & Twine J. 22, no. 10: 10-11 (December, 1948).

Kraft antirust tissue is a pure unbleached sulfate sheet and is therefore always brown. Its principal requirements are freedom from groundwood, lint, or any other impurity which would automatically defeat its protective quality, and close formation to exclude air as much as possible. Fixture manufacturers and wholesalers and retailers of metal and gift wares are good prospects for selling such paper. Sometimes kraft antirust tissue is

also used as an antitarnish wrap for fine metal articles not made of silver. Antitarnish tissue for silverware—sometimes called jewelers' tissue—is of all-sulfite or rag and sulfite stock. The pulp must be thoroughly washed so that it has a sulfur content not exceeding 0.001-0.0001%. No matter how well they are made, neither antitarnish nor antirust tissue can furnish absolute protection against tarnishing under damp conditions. However, the careful wrapping of articles in the tissue will greatly increase their protection. R.R.

ANON. Products dairies buy—and how to sell them. Paper Sales 9, no. 1: 17, 46-7 (January, 1949).

The three principles of sanitation, convenience, and quality which must be observed by any successful dairy are the same basic points to emphasize in selling paper products to the industry. It is suggested that paper salesmen go through a dairy and notice the large volume of paper and related items that are used. In addition to the butter wraps, paper containers for milk, cottage cheese, ice cream, and eggs, and bottle caps and hoods, other products used include toilet tissue, paper towels, drinking cups, straws, office supplies, etc. A list is given of products which may find a ready sale to this industry. It will pay the salesman to keep up with new developments in both the dairy and paper industries, to know the products he is selling and their possible application to the customer's business, to know his competition, and to get the most out of every call made. R.R.

ANON. Restaurant paper service. Paper & Twine J. 22, no. 10: 8-9 (December, 1948).

The sale of more paper products to restaurants is stressed as an important outlet for the paper salesman. In addition to greater sanitation, the use of paper service increases speed of service, controls portions and thus minimizes food waste, and eases labor problems. One restaurant attributes a 25% increase in volume to changing to paper service after nine o'clock at night. In the kitchen, paper also plays an important role in the form of waxed paper, towels, frills for chops, bags for take-out orders, etc. R.R.

ANON. Types of gummed sealing tape. Paper Sales 9, no. 1: 21, 45-6 (January, 1949).

A description, including uses, is given of the following kinds of gummed sealing tape: standard gummed, string inserted, cambric, gummed Holland, gummed glassine, and waterproof sealing tape. The salesman selling such products should be informed not only as to different types, but also weights and widths and the use for which each is intended, carrier rules, and parcel post regulations. For more information than is given in the article, the reader is referred to the 1948 "Paper year book." R.R.

BLAKEMORE, FRED T. Are paper plates just for summer? Am. Paper Merchant 46, no. 1: 23, 29 (January, 1949).

Observation of the paper departments of large Chicago variety chain stores indicates that, whereas the demand for bulk paper plates falls off 50% after warm weather is gone, packaged plates continue to sell almost as well in winter as in summer. Half of the packaged plate sales made in winter are made to families in which both husband and wife are working outside the home. Children's parties and church suppers account for large sales. More packaged colored plates are sold during the fall, winter, and spring seasons than in the summer. R.R.

OXTOBY, FRED. British wall papers win new markets in U.S.A. Paper & Print 21, no. 4: 357, 359 (Winter, 1948).

The author reviews the successful efforts of a British firm, Wall Paper Manufacturers Ltd., to sell greater quantities of their product in the United States. The middle-class market was found to be most promising and it was learned that Americans are more discriminating regarding their wall papers than are the British. Bold decorative motifs and authentic traditional designs are preferred; Old English scenes and chintz and tapestry designs are also popular. Marked differences exist in the tastes of people in the East and on the West Coast. Examples are given of some of the popular patterns. R.R.

PAPER SALES. Sell the full market when you sell paper towels. Paper Sales 9, no. 1: 14-16, 40-3 (January, 1949).

The selling points for paper towels—sanitation, convenience, comfort, efficiency, economy, and good will—apply just as much, except for the last point, for household as for industrial towels. Sales to large consumers now rest on the salesman's ability to convince them of the growing need for providing a quality paper towel. A good product should be strong enough to stay in one piece until the hands are dry, sufficiently absorbent, and easily dispensed; and the stock should be lintless and of a soft pleasing texture. The greater part of the article is in the form of questions and answers regarding paper stock, available forms of towels, weights, folded towels, wet-strength treatment, dispensing, uses, etc. R.R.

PEEDE, LORING G. Newest facial type tissue napkins offer serious challenge to linen. Paper & Paper Products 90, no. 9: 1, 17-18 (Jan. 20, 1949).

Multi-ply facial-type tissue napkins in dinner and luncheon sizes are made of 100% bleached alpha sulfite pulps on single cylinder or Fourdrinier-Yankee machines; the sheets are creped and three plies are embossed together all around the border and usually also across the whole napkin. The finished products exhibit fabric-like qualities, such as softness, drape, and absorbency, and prove to be serious competitors to linen in public places and the home. Merchandising problems and sales arguments for introducing the new products are discussed, the readiest challenge coming from the restaurant, institution, or hotel. E.S.

SHERMAN PAPER PRODUCTS CORPORATION, *Newton Upper Falls, Mass.* 2 new Sherman products. Am. Paper Merchant 46, no. 1: 30 (January, 1949).

A description is given of Inner-Pac Corroflex, a new light-weight flexible corrugated kraft paper for use as an inner pack, featuring patented criss-crossed indentations which permit easy folding in any direction (*cf.* B.I.P.C. 17: 407-8), and a large flat machine-made accordion-pleated bag of kraft and special papers, including creped, waxed, or stainproof (*cf.* B.I.P.C. 19: 336). R.R.

PATENTS

MAKARA, FRANK. Patents—their procurement and significance. Paper Trade J. 128 no. 3: 17-19 (Jan. 20, 1949).

The author outlines the fundamentals for securing patent protection for an invention, including the rights of the inventor. E.S.

PHYSICAL TESTING—COATED FILMS

TABER INSTRUMENT CORPORATION, *North Tonawanda, N.Y.* New Taber abraser tester for coatings. Am. Boxmaker 38, no. 1: 34-5 (January, 1949); Instruments 22, no. 1: 45 (January, 1949).

The new abrasive testing set No. 100-109 operates by alternately rubbing the flat faces of two resilient Calibrase wheels over the surface being tested. A range of standardized abrasive wheels are available for testing all types of surface finishes. New features include an improved suction pump with a vertical dust receiver having a swinging nozzle fully adjustable to any thickness; a built-in variable transformer for adjusting the speed of the suction turbine motor; an adjustable timer on the control panel to provide a test period up to 1000 cycles and then automatically shutting off the power; and a control unit equipped for dual operation. R.R.

PHYSICAL TESTING—PAPER—MOISTURE

HOPE, A. G. Automatic moisture recording for paper users. Paper & Print 21, no. 4: 332, 334 (Winter, 1948).

The latest instruments for recording the moisture in paper give direct and automatic readings of the resistance offered by the moisture to the passage of a fine electric current; the resistance is amplified and is shown as a percentage on an indicator dial. Variations of this idea are considered briefly and one is illustrated. Where highly sensitive laboratory tests are required, an earlier method of baking the moisture out of the paper sample must be used. A discussion is given of the importance to the converting industry of knowledge regarding the moisture content of paper. R.R.

PHYSICAL TESTING—PAPER—SIZE RESISTANCE

ANON. London Division hold scientific discussion. The principles of sizing testing. World's Paper Trade Rev. 130, no. 25: 1678, 1682 (Dec. 16, 1948).

Brief reference is made to a new type of meeting held by the London Division of the Technical Section, the purpose of which was a discussion of the determination of size resistance of paper. Invitations had been extended to any scientific man in the industry who felt that he could contribute to this kind of discussion; no formal paper was presented. The chairman, P. H. Prior, outlined the problem which has many sides to it, so that it is not always clear what actually was sought for in testing. Hence, he thought that they should concentrate on definitions and methods of water penetration. The following discussion dealt with the various liquids and papers involved, the good and bad points of various testers and tests in use, etc. The meeting decided to concentrate on the penetration of water only. Some of the anomalies found in testing were caused by the comparison of very dissimilar papers. Results are far more logical and reliable when samples which are not very different are compared. The use of statistical methods for examining the figures obtained gave more reliable results. E.S.

DELCROIX, PIERRE. How to evaluate writing paper. Bull. assoc. tech. ind. papetière 2, no. 8: 158-60; discussion: 160-8 (December, 1948). [In French]

The author discusses briefly but critically the measurement of porosity and penetration in paper, but the main part of the discussion focuses on the

advantages and disadvantages of the Carson curl test and its various modifications, which appear to give satisfactory results in a few specialty laboratories. The electrical size testers are also discussed critically. Instead of water, it is suggested that there be a Carson penetration test adapted to the various types of printing and writing inks. L.E.W.

PHYSICAL TESTING—PAPER—STRENGTH

EDGE, S. R. H. Factors affecting sheet strength. Proc. Tech. Sect., Paper Makers' Assoc. Gt. Brit. & Ireland 26: 425-31 (December, 1945); *cf.* B.I.P.C. 16: 71.

This is an extension of the data given in the previous reference. Evidence is presented for the fact that alignment of the fibers in the machine direction is not the reason for different strength properties in the two directions of the sheet and that the increase of about 5% in tensile strength on stretching cannot have a noticeable influence on fiber orientation. The importance of the wire mesh size used on the British sheetmaking machine is emphasized. Experiments with 14 different wires showed that the machine needed a complete overhaul and very accurate fitting of the wires to eliminate all traces of air leakage. It was found also that most wires permitted a certain percentage of the pulp (fines in particular) to drain with the water; this was not so serious with good grade pulps, but very noticeable with wet pulps. When, for any purpose, a wire less fine than the standard size is used, the effect will be very much increased. For really accurate work, the pulp suspension should be filtered on a Büchner funnel and the filtrate passed through again until perfectly clear. Tests made on sheets prepared from the identical pulp on coarse and fine wires showed that the strength properties were not appreciably affected, in spite of the difference in basis weight. Brief reference is made to the effect of dilution and the use of a 10-foot high cylinder in connection with a sheetmaking machine. Preliminary tests without special stirring showed that the very large cylinder resulted in weaker sheets; later experiments with stirring gave a considerable increase in strength. In conclusion, the effect of certain salts in the water on the testing results was re-affirmed. In mills using a soft-water supply, these influences are negligible. In two sets of experiments [(I) where the alumina was precipitated in the pulp by adding alum and then ammonia and (II) in which the alumina was precipitated before adding to the pulp and mixed in the gelatinous precipitated form] a considerable increase in strength resulted, particularly with (I). E.S.

EDGE, STEPHEN R. H. Factors affecting the strength of paper. Chemistry & Industry [67] no. 51: 803-7 (Dec. 18, 1948).

This is a somewhat extended review of the author's previous publications on the factors affecting the strength of paper (*cf.* B.I.P.C. 16: 71; 18: 253-4). After briefly referring to Campbell's theory of fiber bonding, the author shows that unequal fiber distribution in the machine and cross-machine directions does not explain the different strengths exhibited by a sheet in these two directions. Stretching the wet web has been found to increase the strength in the direction of the stretch. Alignment of the main fibers, as in artificial silk strands, can hardly account for this phenomenon with a 5% stretch; however, there is a possibility that such an alignment may take place with the very fine fibrils sticking out from the fiber surfaces, thereby increasing the point contact bonds all along adjacent fibrils and causing a much stronger bond to be formed. Plant fibers differ from each other in the ease and in the extent to which they will fibrillate and pick up water and take on the colloidal surface conditions

which enable bonding to take place. Anything which reduces the degree of polymerization of the cellulose molecules, or any oxidation or hydrolysis of the molecule, alters the degree and rate of the alterations which beating is able to effect and which enable stronger paper to be made. These facts explain why so many different types of pulp can be made from one type of wood, and how in some ways a short-fibered pulp like straw can give stronger paper than some much longer-fibered wood pulps. Brief reference is made to Steenberg's work on the rheology of paper, which is based on stress-strain curves in different directions of the paper sheet and to an experiment in the author's laboratory showing the effect of time on the flow properties of sheets of paper. When paper strips, which show an ordinary breaking strength of 10 kg. in the tensile tester, are loaded with a lower weight, a break will eventually occur if the weight is left hanging for a sufficiently long period. The length of time increases rapidly as the weight is reduced, but the amount of stretch which has taken place when the break occurs is the same in every case. In considering the materials which, when added to pulp, give paper of increased strength, the author discusses the effect of starch (rice starch in particular), water-soluble cellulose ethers, wet-strength resins, and gelatinous precipitates formed by some metal salts with certain alkalies. E.S.

PHYSICAL TESTING—PAPER—TEARING STRENGTH

VILARS, J. Tear measurement with a dynamometer. Papeterie 70, no. 12: 397-8 (December, 1948). [In French]

The Elmendorf tear tester and the dynamometer of Lhomme and Argy (*cf.* Papier 33: 1033-4, 1037-8, 1041-3 [October, 1930]) were compared; the latter was found to be more sensitive, and the only method permitting systematic testing of groundwood pulps and newsprint paper. L.E.W.

PINE

SUOLAHTI, O. The influence of the wood quality of Scotch pine upon its resistance to decay. Finnish Paper Timber J. 30, no. 23: 421-5 (Dec. 15, 1948). [In Swedish; English summary]

Different tree species vary in their resistance to decay and, within the same species, heart- and sapwood are often attacked to different extents. Of the Finnish woods, the deciduous species are, in general, more readily attacked than the conifers and, among the latter, pine is more resistant than spruce. The author describes experiments with Finnish pinewood and different fungi for determining the reasons for its greater resistance to fungal attack. In contradiction to earlier assumptions and in agreement with more recent data, the author found that neither specific gravity, density of growth, nor percentage of summerwood have an important influence upon the process of decay. The decisive factor is the quality and quantity of heartwood and its pinosylvin content, which Rennerfelt has shown to be toxic to fungi, although not to all species to the same extent. Of the fungi used in the present experiments, *Lentinus lepideus* was found to be the most aggressive. 5 tables and 12 references. E.S.

PLASTICIZERS IN PAPER

LIVENGOOD, S. M. A guide to humectant selection. Chem. Inds. 63, no. 6: 948-9 (December, 1948).

The author provides a method of estimating the hygroscopicity of mixtures of certain humectants which should eliminate much of the trial and

error in arriving at the best of such products for a particular job. Nonpermanent humectants, used where there is little chance for evaporation or where they are needed for a relatively short time, do not lend themselves to easily interpreted hygroscopicity data; in practice, the loss of humectant during exposure to air and the corresponding loss of water held by the humectant are dependent on its volatility. The variations in volatility overshadow the differences in hygroscopicities. Permanent humectants are readily adapted to hygroscopicity measurements which are easily applied in selecting humectants and mixtures having a given degree of hygroscopicity. They are used as paper softeners, plasticizers, for glue and resin-coated paper, in the manufacture of glassine, etc. Two charts are given from which may be estimated the hygroscopicity of 12 humectants in the range from 10% to 80% R.H. The hygroscopicity of binary mixtures of these humectants may also be estimated in this range. R.R.

PLASTICS

KLINE, GORDON M. The year in review. Modern Plastics 26, no. 5: 107-12, 155-61 (January, 1949); *cf.* B.I.P.C. 18:393.

The author reviews the developments of 1948 under the subheadings: materials, German plastics, processing, applications, adhesives, properties, testing, and specifications. 373 references, grouped according to the subheadings. E.S.

MEYERCORD COMPANY, *Chicago.* Printed plastics film makes decorative veneers. Plastics [U. S.] 8, no. 12: 15-17 (December, 1948).

A process is described by which rare wood or marble grains are photographed and printed directly on thin plastic films (cellulose nitrate, cellulose acetate, ethylcellulose, vinyl, acrylic, acetate butyrate, urea, or phenolic films), which can then easily be cemented to any type of surface. The choice of the proper plastic film depends upon the quality desired in the film and on the surface to which it is to be applied. Not only the film and the surface to which it will be cemented must be compatible, but also all constituents used during the manufacturing procedure must be compatible with one another. The methods for preparing the printing plates and plastic films and for applying them to the surface to be covered are described. To facilitate the printing operation and handling of the printed film, a specially manufactured paper (known as Duplex) is used to serve as a base for the ink and plastic. The paper consists of a heavy backing, to which a fine tissue is laminated by heat and pressure. A thin coating of water-soluble dextrin is applied to the fine tissue to provide good adhesion of the plastic film to the paper. A clear coating of liquid plastic is deposited onto the dextrin and allowed to dry; the film is then ready for printing. The ink used must be dispersed in vehicles of the same plastic type as the film. The printing is carried out in reverse, so that the surface lying against the dextrin carries the design and is uppermost when both parts of the Duplex paper have been stripped off. When the printing inks have dried, a final plastics coat, either clear or opaque, is applied on top of them. The printed films are applied by means of squeegees, heat and pressure, or with a special welding solution, in most cases with the paper backing still in place. The heavy paper backing may be removed simply by peeling it off, and the thin tissue and dextrin by using a damp sponge; this can be done immediately after application of the film or after a period of months. The radio trade and furniture industries are the largest users of this process. E.S.

MODERN PLASTICS. 1948 . . . and the future. Modern Plastics 26, no. 5: 55-78, 137, 139-42, 144-6, 148-50, 152-5 (January, 1949); *cf.* B.I.P.C. 18: 393.

A review for 1948 and a forecast of the future trends are presented, including statistical data, some of which are estimates. The supply and demand of phenolics, vinyls, polystyrene, cellulosics, saran, polyethylene, acrylics, urea and melamine, and nylon are discussed; under the heading "Where plastics are made" the activities and expansion programs of the various manufacturers are described. In conclusion, resin statistics from the U. S. Tariff Commission are given. E.S.

PLASTICS—PAPER-BASE

KINNEY, LAYTON C., and FERENCE, GEORGE G. Research in resin impregnated fiber for low-cost furniture. The Frontier 11, no. 4: 3-6, 18-21 (December, 1948).

The Armour Research Foundation has been studying the possibilities of devising a method of furniture manufacture conducive to mass production operations, using low-cost materials with little or no waste, and minimizing or eliminating the use of joints to hold the furniture together. A description is given of the method used for pulping unbleached northern kraft paper, making a preform of a chair body with the resulting fibers, impregnating it with resin, and curing it under heat and pressure. Both the felting of the die and the drying of the preform were accomplished without difficulty. The thickness of the preform and the felting time were dependent on the pulp freeness. The side of the preform next to the felting die was smooth except for the imprint of the screen design on it. The other side had a slightly wrinkled appearance which can be prevented by covering the felt with a rubber diaphragm while the die is still immersed. It is possible that water-soluble or -dispersible resins could be added to the felting tank, thereby combining the felting and impregnating operations. The chair bodies were about $\frac{3}{16}$-inch thick, smooth in texture, and rich in color, possessed a warm feeling similar to wood, and required no additional finishing except to buff off a small amount of flash from the edges. The physical properties were as good as or better than wood, and a repeated-blow test indicated a long life for the furniture. Nails and screws could be used with the unpressed chairs, showing that they could be used as understructures for upholstered furniture. Color possibilities are unlimited. The material costs were amazingly low, averaging about 25 cents/lb. However, the chief economy consists in the reduction of the hand labor necessary. Other items which could be similarly made are desk and bureau drawers, coffee tables, end tables, and children's furniture. Illustrations of the process and the products and flow sheets are included. R.R.

ROHM & HAAS COMPANY, *Resinous Products Division*. Resin-paper coupler. Chem. Inds. 63, no. 6: 936-7 (December, 1948).

The electrical industry, largest consumer of high-pressure laminates, has been unable to use cellulose-polyester laminates because they possessed too low rigidity and poor dimensional strength in water. To overcome this defect, a process has been developed whereby the polarity of cellulose fibers is reduced by pretreatment with a low molecular-weight urea-formaldehyde condensation product, Uformite 609. Tests indicate that such pretreatment of paper can bring low-pressure contact-resin laminates into competition with commercial grades of paper laminates made with phenolics under high pressure. R.R.

POLAROGRAPHY

LINGANE, JAMES J. Polarographic theory, instrumentation, and methodology. Anal. Chem. 21, no. 1: 45-60 (January, 1949).

With the aid of diagrams and illustrations, the author reviews the literature of the past 12 years on polarographic developments which indicate the lines along which the subject is currently progressing. Information is given under the following headings: polarographs, cells, special mercury electrodes, and solid microelectrodes; limiting currents controlled by reaction rates, diffusion current, water current, simultaneous cathodic-anodic reactions, mutually interfering reduction reactions, polarography in liquid ammonia, and polarography in fused salt media; and oscilloscopic polarography, differential polarography, standardized diffusion current constants, electrolytic separation prior to polarographic analysis, coulometric analysis, and zero current potential of dropping electrode. 112 references. R.R.

WAWZONEK, STANLEY. Organic polarography. Anal. Chem. 21, no. 1: 61-6 (January, 1949).

The considerable advance of organic polarography in the past eight years is reviewed, information being given on reversible systems and the following irreversible systems: aldehydes, ketones, acids, organic halides, nitro and nitroso compounds, unsaturated hydrocarbons, peroxides, sulfur and heterocyclic compounds, and the determination of metals. Structural formulas are given. 146 references. R.R.

POLYMERIZATION

MARK, HERMAN. Recent trends in polymer chemistry. Chem. Eng. News 27, no. 3: 138-42 (Jan. 17, 1949).

Trends in plastic research, synthetic rubbers with exceptional qualities, and new developments in fibers and films are reviewed. E.S.

PRINTING AND PRINTER'S INK

"A.M.B." Confusing paper terms. Paper Market: 158 (December, 1948).

The author refers to certain paper terms which are often confusing to printers and other paper converters, such as grain and machine and cross-machine direction. There is a considerable difference between stretch and expansion of paper. Stretch may be the outcome of the tension of the printing machine, which has the effect of pulling on the sheet, whereas expansion is the natural outcome of the individual fibers absorbing moisture. An expression which is not often encountered today is that of green paper, referring to paper taken straight from the machine without having an opportunity of adjusting itself to the surrounding atmosphere; its opposite expression is matured paper. E.S.

ANDELLA, D. J. Evaluation and analysis of printing results. Paper Trade J. 128, no. 4: 23-7 (Jan. 27, 1949).

The author reviews the various steps involved in the process of making plates and preparing copy, either black and white or color, for the press. The printer's commanding requirements of a paper for fine printing are enumerated as follows: consistent, uniform performance throughout the entire press run; uniform smoothness; good ink receptivity; good surface strength or resistance to picking; a high degree of opacity; uniformity

of color; uniform thickness; proper moisture content; and permanency in color and body. E.S.

DELLER, JACK. What to do when printing metallic papers with foil inks. Am. Printer 128, no. 1: 27-9 (January, 1949).

The author gives practical suggestions for using metallic foil papers which, because they are composed of sheets of metal adhered to paper backing, require particular care in handling and printing. The printer must remember that ink dries on such stock entirely through oxidation, the metal which forms the printing surface allowing no ink penetration. Consideration is given to storage, trimming, curling, accurate register, estimation of overs, ink, sticking, aids to drying, use of nonoffset spray, and show-through. R.R.

RAYON—VISCOSE PROCESS

BERGEK, TRYGGVE. The viscose process as object of research. Norsk Skogind. 2, no. 11: 289-96 (November, 1948). [In Swedish; English summary]

The chemistry of the viscose process is of considerable importance to the manufacturer of dissolving pulp; unfortunately, our knowledge of the various reactions involved is rather limited and shows serious gaps. With frequent reference to the data supplied by other investigators, the author outlines the points of major interest where additional information would be highly desirable. The rate of degradation during the ripening of the alkali cellulose decreases when a D.P. of about 150 has been reached. This may be caused by the fact that the inner parts of the crystallites are not exposed to the degrading attack. In all cases, a higher speed of reaction may be expected in the amorphous parts of the fiber wall, so that it is reasonable to assume that the technical xanthation at least is an intermicellar reaction. However, this theory does not necessarily imply that viscose is a micellar solution. The chemistry of the reactions involved in the xanthation process is discussed briefly. The author considers it probable that the carbon disulfide does not react directly with the alkali cellulose, but that dithiocarbonate, formed as an intermediate from carbon disulfide and sodium hydroxide, may possibly be the actual xanthating agent. Variations in viscosity of viscose caused by variations in its alkali concentration may be ascribed to both an agglomeration and a solution effect (*cf.* also Samuelson, B.I.P.C. 19: 345-6). 20 references. E.S.

KLEINERT, THEODOR, and MÖSSMER, VIKTOR. The suitability of pulps for the manufacture of viscose. Svensk Papperstidn. 51, no. 22: 541-5 (Nov. 30, 1948). [In German; Swedish and English summaries]

The method of Klauditz and Berling for determining the reactivity of pulps (*cf.* B.I.P.C. 18: 663-4) has been applied to pine- and beechwood pulps produced under known technical conditions. It was found that the filterability of viscose produced from these pulps passed through a maximum, the position of which depended upon the amount of carbon disulfide added during xanthation. This result, however, allows only general conclusions to be drawn with regard to the technical suitability of the pulp. The clogging of the filter depends upon swollen substances which remain on the filter when the viscose solution does not filter well. These substances are largely dispersed upon dilution with water and appear to consist of high-molecular xanthated portions of the original material used, whereby biological structures are retained. On the other hand, undissolved residues of

the fiber—such as occur normally in technical viscose—affect the filtration but slightly. The macro-inhomogeneities of technical viscoses can be traced to the fact that, in addition to the main portion of soluble compounds, insoluble highly swollen gels of cellulose xanthate occur. The difficulty experienced in filtering viscose for spinning purposes is, above all, caused by compounds with a D.P. higher than 700. The suitability of cellulosic material for the manufacture of viscose depends not only upon the distribution of chain lengths in the starting material but, particularly, upon changes in this distribution in the course of processing, notably the aging of the alkali cellulose. 13 references. E.S.

RESEARCH

ROBINSON, KARL DAVIS. Research 'round the world. Modern Lithography 17, no. 1: 45, 47, 97 (January, 1949).

Since World War I, technical advances in offset lithography and related equipment and supplies have been greater in the United States than elsewhere. Membership in the Lithographic Technical Foundation has grown to include 18 foreign countries since 1945. A discussion is given of the cooperation of the Foundation with other organizations and its library project, and of the research program of PATRA in England, the Graphic Arts Research Foundation of Sweden, and the Swedish Forest Products Research Institute. R.R.

STEVENSON, LOUIS T. The future of research in the paper industry. Paper Mill News 72, no. 1: 16-17 (Jan. 1, 1949); Paper Ind. 30, no. 10: 1532-3 (January, 1949).

The author divides research in the paper industry into market, production, and raw material research, a vast field existing in each of these subjects. He then discusses the aspect of wood as a raw material in papermaking with particular reference to the present limited timber supply and the enormous field for research activities in wood utilization for maintaining the industry's growth. Brief reference is made to the existing research laboratories largely devoted to the problems of the paper industry and to the future of this research work. Historically, paper consumption has been growing at a faster rate than population, a projected trend of per capita consumption indicating that by 1955 it may reach 400 pounds per capita. The paper industry depends upon research activity for developing the techniques for the use of new raw materials, for developing new products, and for finding and developing new markets. In a broad sense, the industry owes much to research for its development and progress. As long as the paper industry will continue to grow, research activity will grow with it. E.S.

RESEARCH LABORATORIES

ANON. British Printing, Packaging Research Association in new £110,000 laboratories. Paper Trade J. 127, no. 27: 10, 36 (Dec. 30, 1948); Fibre Containers 34, no. 1: 88-9 (January, 1949); Am. Ink Maker 27, no. 1: 49 (January, 1949); *cf.* B.I.P.C. 19: 347.

A brief description is given of the recently opened research laboratories of the Printing, Packaging & Allied Trades Research Association at Leatherhead, Surrey, England; reference to the activities of PATRA is made. E.S.

ANON. Crossett's new research laboratory in operation. Southern Pulp Paper Manuf. 12, no. 1: 48, 50, 52 (January, 1949).

An illustrated description is given of the recently opened research laboratory of the Crossett Lumber Co. at Crossett, Ark. The aims and objectives of research at Crossett are briefly outlined. E.S.

CHIDESTER, G. H. Facilities for pulp and paper research at the U. S. Forest Products Laboratory. Indian Pulp and Paper 3, no. 5: 203-8 (November, 1948).

The full text of Mimeograph No. R1499 of the Forest Products Laboratory (revised April, 1948) is given; only three illustrations are reproduced. E.S.

MALM, GÖSTA, and SYLWAN, EINAR. Report of the activities of the Swedish Forest Products Research Laboratory during the fiscal year 1947-1948. Svensk Papperstidn. 51, no. 23: 561-6 (Dec. 15, 1948). [In Swedish]

The report covers the general activities, staff members, progress of construction work and equipment installed, a balance sheet, and a list of publications. E.S.

RESIN, SYNTHETIC—IDENTIFICATION

WIDMER, G. Identification of melamine and urea resins in wet strength paper. Paper Trade J. 128, no. 4: 19-22 (Jan. 27, 1949); *cf.* B.I.P.C. 19: 112.

This is the English translation of the German article which has been abstracted from the original. E.S.

RHEOLOGY

WARD, A. G., and FREEMAN, P. R. The rheology of stiff pastes. J. Sci. Instruments 25, no. 11: 387-96 (November, 1948).

The general behavior of stiff pastes is discussed in order to select the most suitable form of apparatus for rheological measurements. Two new instruments (each of the concentric cylinder type) which can be applied to different types of stiff paste are described. The first relies on the use of a narrow annulus to enable absolute calculations to be made and incorporates a novel method of filling by using a split outer cylinder. It cannot be used satisfactorily with systems showing very rapid shear hardening, for which the second instrument was designed. This instrument enables the shear to be determined at all points across a wide annulus. Measurements show that, for some systems, Bingham's law of plastic flow is obeyed for each value of the shear, the effect of the shear hardening being to give an increasing value to the yield stress as the amount of shear increases. Two new ideal rheological bodies are suggested (the paste of limited plasticity and the completely plastic paste) and the effect of hydrostatic pressure on the flow properties of materials is discussed. 33 references. E.S.

SHIPPING CONTAINERS

HUNT, W. G. Control of container quality. Am. Boxmaker 38, no. 1: 29-31 (January, 1949); Shears 66, no. 672: 42-4 (December, 1948).

Many boxmakers withhold all inspection until the product is ready for shipment, when it is too late to improve the container's quality. Constant

check should be maintained on the quality level of the liners, corrugating media, adhesives, and other materials that go into the final product. Attention must be focused on each manufacturing operation, with emphasis on maintaining a standard acceptable performance from each center. Some of the possible defects that the single-face operator must constantly look for are given to illustrate the importance of each person's inspecting his own work. High-quality production does not interfere with high-speed operations, since the latter may be said to depend on quality achieved by control of the operation's possible defects. To assist each operator, there should be roving inspectors who can devote all the time necessary to any specific trouble spots. Through the use of statistical procedures, as few as five samples daily have been found sufficient to indicate clearly the effect of controls placed on specific centers in individual plants and show where improvements should be made. In conclusion, the author stresses the importance of good design to ensure that the container will give adequate protection and the advisability of teaching container salesmen proper packing, stacking, sealing, and car-loading methods. R.R.

THE OHIO BOXBOARD COMPANY, *Rittman, Ohio.* Paperboard cigar box can withstand pressure of 300 pounds when empty. Packaging Parade 17, no. 192: 46 (January, 1949); Fibre Containers 34, no. 1: 100-1 (January, 1949); Am. Boxmaker 38, no. 2: 12 (February, 1949).

A new cigar box, constructed of a special 0.04 paperboard, is resilient and shock-absorbing and weighs about half as much as the conventional box. It is shipped flat and set up for filling on a general purpose carton former which handles about 60 boxes per minute. The filled carton is overwrapped with Pliofilm. Newly developed shipping containers of gold liner corrugated board are printed with the color and design of the cigar boxes and reflect the growing trend toward co-ordination of shipping container and consumer package design. R.R.

SHIPPING CONTAINERS—FROZEN FOODS

JIFFY MANUFACTURING COMPANY, *Hillside, N.J.* Ice cream stays frozen in new insulated shipping container that requires no "thawing out" after contents are removed. Packaging Parade 17, no. 192: 72 (January, 1949); Shears 67, no. 673: 48 (January, 1949).

Mello-Serv, a new insulated shipping container, keeps ice cream at just the right temperature for eating. The box is of regular Jiffy construction with a corrugated outer box and a liner. A collar supports a corrugated tray or shield, above which dry ice is placed. Illustrations are included. R.R.

SHIPPING CONTAINERS—LOSS AND DAMAGE CLAIMS

GREEN, ALBERT L. The railroads will cooperate. Fibre containers 33, no. 12: 66, 68, 73 (December, 1948); *cf.* B.I.P.C. 19: 195-6.

The estimated cost of damage claims paid by the railroads in 1948 is approximately $6,400,000, sufficient reason for studies and preshipment testing of packaged goods. As high as 95% of all claims, except on mail-order house business, are presented by consignees; the shipper knows nothing about them except for the ordering of replacement parts or claims of large amounts where the shipper is usually brought into the investiga-

tion by the railroad. Packing rules express only the minimum protection required, and many are general. Details for each article should be worked out by the shipper's packaging engineer. In addition, the performance of the packaged product in transportation to the consumer must be determined by field studies. The efficiency of basing package standards on performance is well illustrated by the comparatively low number of claims made for damages to military material during the war. Extensive tests made on glassware packages during the past year showed that about 25% of the articles were inadequately packed, even though the packages complied superficially with all requirements of the Freight Classification; some articles were overpacked. A damage prevention program based on cooperation between manufacturer and shipper, such as that suggested by the Packaging and Shipping Committee of the Porcelain Enamel Institute, will be successful. R.R.

LINCOLN, W. B., JR. Shipper's responsibility for damage prevention. Fibre Containers 33, no. 12: 116-18 (December, 1948); *cf.* B.I.P.C. 19: 350.

An analysis is made of the results of a test shipping program of the Shipping Container Institute made about a year ago. Over a million containers were observed, 1% of which were damaged to some extent. Of this figure, 0.3% were damaged to the point where claims were filed. Shipper faults were the cause of 39.5% of the dollar value of the claims, carrier faults caused 43%, and unassigned causes were blamed for 17.5%. It is necessary that industry recognize that packing and loading are important managerial responsibilities and that those responsible should be given sufficient authority. The product must be designed so that it can be packed and shipped safely. Packing must conform to carrier rules and carry the product safely; containers should be purchased only from responsible, technically competent suppliers. Handling and warehousing practices must be sound and only those cars loaded which have been carefully prepared for use. Usually several hazards, including the contributory negligence of the shipper, are responsible for severe loss and damage; care on the shipper's part often enables shipments to withstand other hazards met in transit. R.R.

SHIPPING CONTAINERS—MULTIWALL BAGS

MITCHELL, A. HARRIS. St. Regis makes B.C. kraft paper into widely used multiwall bags. Western Pulp and Paper 1, no. 4: 6-9, 21 (November, 1948).

In January, 1938, the St. Regis Paper Co. opened its one-story plant at Vancouver for the production of automatically filled multiwall paper bags in heavy duty sizes. The new two-story building in Kitsilano (section of Vancouver) was occupied in April, 1947. The new plant purchases all its paper (about 725 tons a month) from Pacific Mills, although the laminating that is necessary is done by the Powell River Co. Over 2,000,000 bags are produced a month, working on a single shift. An illustrated description of their manufacture and a history of valve bags are given. Because it has developed an ingenious line of patented automatic filling machines, the company is in the unique position in this field of being able to lease equipment while guaranteeing a regular supply of bags. R.R.

SHIPPING CONTAINERS—TESTING

PERRY, A. N. The use of a test track in developing good packaging and carloading methods. ASTM Bull. no. 155: TP246-7 (December, 1948).

A brief description of the Signode test track installation is given. It consists of a standard railway track, 315 feet in length, with an inclined trestle at one end and a power winch at the top, capable of pulling a loaded freight car up the incline. Two standard railway cars are part of the equipment, one a flat car loaded with concrete blocks and used as bumper car, and the second a box car with one side removed to permit observation of loads at the moment of impact. Either the test car is caused to collide with the bumper car or vice versa, as would happen in a freight yard. A chronograph measures and records the speed at which a car is moving before, during, and after impact. The standard testing procedure is to start at low impacts (4 miles/hour switching range), gradually increasing the impact until failure occurs or the load survives the limit, usually 9-10 miles/hour. In conducting these tests, the reasons for failure are usually detected and can be corrected before extensive damage to the test load occurs. A few examples are given. E.S.

PORCELAIN ENAMEL INSTITUTE. Two recommended tests for reducing shipping damage to porcelain enameled products. Packaging Parade 17, no. 192: 75-6 (January, 1949); *cf.* B.I.P.C. 19: 197.

Only the impact and vibration tests, both of which are described, are recommended for testing the ability of packaged porcelain enamel products to withstand normal handling in transit. The impact test, developed by the Association of American Railroads and issued as A.S.T.M. specification D 880 46-T, simulates the longitudinal shocks and impacts received in actual shipment. The vibration test determines the ability of the container, interior packing, and the product to withstand vibrational shocks encountered in transit. After both tests, all porcelain enamel parts and all appurtenances on the product must be free from damage of any kind and the container must be able to afford reasonable future protection. A shock recorder made by The Impact Register Co., Champaign, Ill., is recommended for use with the two tests. The carriers' association's approval of the suitability of the testing procedure and equipment has been secured, and also mutual agreement on their severity and duration. Most major home appliance associations have endorsed the program and have offered to secure its adoption by their members. Because the testing equipment costs no more than $2000, this expense can be made up within a few months by savings on transit losses. Independent testing laboratories located near small porcelain enameling plants are being encouraged to install such equipment. R.R.

QUINN, DON. Standards based on performance. Fibre Containers 34, no. 11: 77 (November, 1948); Shears 66, no. 672: 37 (December, 1948).

The text of the recommended standard of the American Glassware Association is given which—after nearly 18 months of tests and study—recommended an industry-wide standard for the packaging of its diversified products. The Association was working in co-operation with the Official Classification Committee; the agreement was the first co-operative effort of carriers and industry to establish a standard based on performance. If approved, it will replace section 5 of Rule 41. E.S.

SILICATE OF SODA

WILLS, JOHN H., and SAMS, ROBERT H. Industrial adhesives; review of colloidal properties of sodium silicate. Ind. Eng. Chem. 41, no. 1: 81-6 (January, 1949).

The general qualities of sodium silicate solutions which have caused over 800,000,000 pounds of them to be used in 1947 as industrial adhesives are reviewed with reference to recent studies and available data. The effect of the ratio of sodium oxide to silicon dioxide and water content on colloidal, rheological, reactivity, and strength properties is emphasized. Study of the viscosity change in drying indicates that an initial set occurs at about 40,000 poises and that this requires the loss of less than half the amount of water which equilibrium conditions would require. The rate at which such adhesives wet paper depends on the ratio of sodium oxide to silicon dioxide as well as on the viscosity or concentration. Wetting agents appear to strengthen the bond only as they increase the spread. The strength of the bond tends to decrease for equivalent spreads. There is a real need for a study of the tack strength of such adhesives and for a study of the colloidal structure by modern techniques. Application of the properties outlined has resulted in the development of new products and mixtures with clay, etc., which meet the needs of modern high-speed machines. 26 references. E.S.

SLIME PREVENTION

APPLING, JOHN W. Determination of rate of slime accretion in paper mill systems. Pulp & Paper 23, no. 1: 90, 92-3 (January, 1949).

The need for an objective evaluation of slime control programs has led to the use of various bacterial approaches, such as determining the types of micro-organisms present in paper mill slime and making estimates of bacterial populations by plate counts. The limitations of these methods are discussed. A description is given of two slime measuring units, one designed by the Technical Department of the Union Bag and Paper Co. and the other by Buckman Laboratories, Inc., and known as S-254. Representative data from five types of paper mill systems are presented to illustrate the application of the S-254 unit to slime control programs. A reasonably satisfactory level of slime control is achieved when the rate of slime accretion is less than about 20 g./1000 sq. cm./24 hrs. as determined with this unit. However, the permissible rate of accretion may vary not only for different mills but also within the same system under different operating conditions. It must be evaluated further in terms of the losses caused by slime. A schematic diagram of the Buckman unit is included. R.R.

KING, GLEN D., and VENABLES, J. V. Requisite considerations for good slime control. Pulp & Paper 23, no. 1: 80, 82-5 (January, 1949); *cf.* B.I.P.C. 14: 382-3.

The authors point out the individuality of mill slime troubles and present the methods used in eliminating an acute slime problem arising from an organism not previously encountered. After identifying the slime and locating the source of the organisms, it was determined that sterility was obtained above 115° F., temperatures in the groundwood mill system were raised, and the trouble from this source was eliminated. By this time, the slime organisms were entrenched farther on the paper machine systems and were particularly prevalent in the paper machine chest, flow boxes, service boxes, and other points of low flow with sufficient aeration. The trouble was controlled by paper machine chemical application, cleanup and metal lining of the mill systems, laboratory control setup, and laboratory evaluation of control chemicals, each of which is discussed. Emphasis is given to the need for co-operation between the laboratory, mill men, and the technical sales consultants of slimicide manufacturers. Tabulated data show the results of the laboratory evaluation and testing procedure for

new slime control agents now on the market. 10 plates and 15 references. R.R.

KIRCHEN, CHARLES P. Evaluation of losses caused by slime in paper mills. II. A kraft paper mill and a nine-point board mill. Paper Trade J. 127, no. 27: 20-5 (Dec. 30, 1948); Southern Pulp Paper Manuf. 12, no. 2: 44, 46, 48, 50, 70 (February, 1949); *cf.* B.I.P.C. 19: 273-4.

The losses suffered in production from slime in two southern mills are discussed. The loss in the kraft papermill was estimated to amount to at least 90 cents/ton of production, and more probably up to $1.70. The corresponding figures for the board mill were at least $1.55/ton and probably greater than $1.90/ton. In southern mills, producing upward from 400 tons per day, slime losses, where they occur, represent a substantial amount. An evaluation of the magnitude of the losses caused by slime in a mill is a sound first step and should be made, so that an appropriate amount of money and time can be budgeted for the control program. The need for careful following of the losses caused by slime is as great in new mills and new machine systems as it is in older ones. By the use of the slime measuring unit, the slime control report form, and the large control chart, those charged with the operation of the new production equipment can closely follow the influence of slime on the process. E.S.

SODERBERG, FREDERIC A. Commercial development of slimicides. Pulp & Paper 23, no. 1: 85-6, 88 (January, 1949); *cf.* B.I.P.C. 18: 788.

The author considers the commercial development of slimicides from the beginning of the idea, involving literature searches and market studies. He investigates four possibilities: (1) the manufacture and sale of one product, (2) the purchase of chemicals and compounding of them into one item (3) or into several mixtures containing various percentages of the active ingredients, and (4) the production or purchase of several unrelated chemicals to be marketed as a dispersing agent, a bactericide with fungistatic properties, and a fungicide with bactericidal efficiency, giving the disadvantages of each possibility and the advantages of the last. A chart is given showing the stages in the exploitation of a new chemical product. R.R.

SPECTROSCOPY

BARNES, R. BOWLING, and GORE, ROBERT C. Infrared spectroscopy. Anal. Chem. 21, no. 1: 7-12 (January, 1949).

A review is given of the literature of the past eight years showing the major trends in various phases of industrial infrared spectroscopy under the headings: instrumentation; dispersing systems; oscillographic recording; cells, windows, and other accessories; polarized radiation; gas analyzers; emission spectra; qualitative analysis; quantitative analysis; hydrogen bonding; and theoretical and molecular. 302 references. R.R.

SPONGES, ARTIFICIAL

MITCHELL, A. HARRIS. Sponges are B.C. forest's newest crop. Western Pulp and Paper 1, no. 1: 22-3 (August, 1948).

Artificial sponges made by Canada Pulp Products Ltd., Vancouver, resemble natural sponges in appearance, possess an even greater affinity for water, do not tear easily, and can be sterilized by boiling. The process,

which originated in Denmark, depends on a secret formula. The chief raw material is bleached and unbleached dissolving pulp from which viscose is made. To this are added a shredded vegetable fiber, usually flax, which acts as a binding material, and crystals of Glauber's salts. The mixture is kneaded, poured into large molds, and baked. The heat hardens the viscose and melts the crystals, which dissolve in their water of crystallization to give the viscose a sponge-like structure. R.R.

STARCH

MEYER, KURT H., BERNFELD, P., RATHGEB, P., and GÜRTLER, P. Research on starch. 41. The degradation of starch by β-amylase. Helv. Chim. Acta 31, no. 6: 1536-40 (Oct. 15, 1948). [In French]

The authors' improved method (*cf.* B.I.P.C. 18: 631-2) for degrading the components of starch with the enzyme β-amylase has been applied to amylopectin. It was found that crude corn amylopectin (containing 8% amylose) underwent degradation to the extent of 65.5%, whereas pure corn amylopectin stopped sharply at 62% and potato amylopectin at 59%. Lower values reported in the literature were probably the result of crystallization of certain regions of the amylopectin. The enzymatic synthesis and arrangement of the glucose residues of amylopectin are discussed. J.W.S.

MEYER, KURT H., and RATHGEB, P. Research on starch. 40. The amylose from potato starch. Helv. Chim. Acta 31, no. 6: 1533-6 (Oct. 15, 1948). [In French] *cf.* B.I.P.C. 18: 632.

The usual Schoch butanol precipitation method for separating amylose from starch leaves about 8% amylose in the amylopectin fraction whereas, if the starch is first swollen and extracted (fraction A_1) with warm water at 65-70° C. according to Meyer's technique, the Schoch method then separates the remaining amylose (fraction A_2) practically completely from the amylopectin. This indicates that the more easily soluble and lower molecular weight fractions of amylose are not precipitable by butanol in the presence of large quantities of amylopectin. Cornstarch will gel much more rapidly than potato starch, because the molecular weights of the amylose fractions of cornstarch are considerably greater than those of potato starch. The molecular weights of the respective fractions of potato starch are: amylose A_1, 11,500; amylose A_2, 110,000; amylopectin, 180,000. The corresponding molecular weights of the cornstarch fractions are: amylose A_1, 13,000, 24,000, and 33,000; amylose A_2, 340,000; and amylopectin, 45,000. J.W.S.

MEYER, KURT H., and RATHGEB, P. Research on starch. 42. Determination of the acids formed upon periodate oxidation of polyols. Helv. Chim. Acta 31, no. 6: 1540-5 (Oct. 15, 1948). [In French]

A method is described by which the formic acid produced upon periodate oxidation of polyhydroxy compounds can be quantitatively determined. The oxidation is carried out with periodic acid which has been neutralized to pH 4 with sodium hydroxide. Aliquots of the oxidation mixture are removed at intervals, treated with ethylene glycol, and titrated to a Phenol red end point. A control is run with the glycol alone. Data are given for mannitol, mannitol-glycol mixtures, rhamnose, glucose, sucrose, and lactose. J.W.S.

MEYER, KURT H., and RATHGEB, P. Research on starch. 43. The determination of end groups in starch and glycogen. Helv. Chim. Acta 31, no. 6: 1545-8 (Oct. 15, 1948). [In French]

The method of determining the formic acid produced by periodate oxidation of polyols (*cf.* abstract above) was applied to the determination of the nonreducing end groups present in potato starch and beef liver glycogen. The number of such end groups per molecule for different carbohydrates is as follows: maltose, 1.1; potato amylose, 0.9; potato amylopectin, 46; and beef liver glycogen, 63. J.W.S.

STATISTICAL METHODS

WERNIMONT, GRANT. Statistics applied to analysis. Anal. Chem. 21, no. 1: 115-20 (January, 1949).

A review is given of the literature, including explanations of statistical methods used in agriculture, biology, and medicine, and showing how they are or can be applied to chemical analysis. The author presents his discussion under the following headings: historical, statistical quality control, theory of statistics and statistical methods, frequency distributions, control charts, variance analysis, statistical correlation, other statistical methods, sampling, design of experiments, statistics in contributions to the literature, and literature of statistics and statistical methods. 134 references. R.R.

STEEL STRAPPING

BUCUSS, J. G. Tested methods of protecting paper shipments. Paper Mill News 72, no. 4: 40-1, 48 (Jan. 22, 1949).

The author describes the different methods of steel strapping for protecting paper on skids or in rolls in transit. Skid loads can be braced in three different ways: by the full floating, the vertical load, and the anchor-bracing method. Paper shipped in rolls can be protected from chafing (damage resulting when vibration or impacts cause the individual rolls to turn and to oscillate vertically) by the three following practical methods: the skid check method of strapping the rolls, the fiber cradle method, and the vertical anchor method. Details of each method are given. 4 illustrations. E.S.

STRAINS AND STRESSES

HAMBURGER, WALTER J. Mechanics of elastic performance of textile materials. I. Development of an elastic performance coefficient in tension. II. The application of sonic techniques to the investigation of the effect of visco-elastic behavior upon stress-strain relationships in certain high polymers. Textile Research J. 18, no. 2: 102-13; no. 12: 705-43 (February, December, 1948).

The factors which affect the textile quality usually known as resilience are discussed, and a normalized coefficient is derived which expresses quantitatively the degree of resilience of textile fibers. The use of the term "elastic performance," rather than "resilience," is suggested. The dependence of elastic performance upon the fundamental load-deformation properties of textile materials is considered and it is demonstrated that the elastic performance coefficient reflects the effect of immediate-elastic, primary-creep, and secondary-creep deflections. The coefficient is indicated to be applicable to all types of loading: tension, compression, bending, torsion,

etc. All that is required for its calculation is a load-deformation diagram under uniform, controlled, cyclical loading and unloading. Data are presented upon the tensional elastic performance of continuous filament acetate rayon and fully drawn nylon under various magnitudes of tension loading, including variations with twist for the rayon yarn. A technique is developed for the quantitative evaluation of the deformation components of visco-elastic materials when these are subjected to tensile loading, for loads ranging from zero to rupture, under dynamic loading conditions, at constant rates of load, elongation, or strain for different magnitudes of constant rates of load, elongation, and strain. The technique serves not only to determine the mechanism of elastic performance of materials but also to evaluate quantitatively their performance characteristics as engineering materials. A sensitive and responsive instrument employing sonic techniques (Pulp Propagation Meter) for the determination of the dynamic modulus of elasticity of materials under any and all loading conditions has been developed and is described. The effects of the visco-elastic behavior of high polymers upon their stress-strain relationships are investigated and discussed. Tabulated data, illustrations, diagrams, and 29 references. E.S.

SULFATE MILLS

BLOEDEL, STEWART & WELCH LIMITED, *Port Alberni, B.C.* Slab waste feeds Port Alberni mill. Western Pulp and Paper 1, no. 1: 18-19 (August, 1948).

A description is given of the first fully integrated saw- and pulp-mill unit in western Canada. The sulfate mill is designed to use the waste slab wood from the sawmill. The plant layout provides another unusual feature in that the blow tank, recausticizing system, storage tanks, and kiln are out in the open. The processing is described and a flowsheet is included; the modern recovery system, on which much of the plant's efficiency depends, is discussed. The daily production of the mill is 165-200 tons of pulp, of which about 60% goes to the United States. R.R.

SORG PULP COMPANY, LIMITED. Port Mellon improvements by Sorg Pulp Company. Western Pulp and Paper 1, no. 1: 7-8 (August, 1948).

The $2,000,000 expansion program under way at Port Mellon, B.C., will increase the pulp output of the plant by over 40% and make production a smoother, more efficient, and more economical process. The most important of the new features is the chemical recovery system and includes a sextuple Swenson evaporator. A new Dunbar chipper has a horizontally revolving disk, thus eliminating the need for chip screens. A two-stage Swenson Nyman washer, a battery of Trimbey screens, oil-burning equipment, and improvements in the No. 1 and 3 machines are other changes. During 1949, four stationery digesters will replace the present tumbling digesters and a 3000 kv.-amp. Westinghouse turbo generator will be installed. Most of the Port Mellon production goes to the Middletown, Ohio, plant of the Sorg Paper Co. R.R.

SULFITE PROCESS

ANON. Studies on the steam consumption in digesters equipped with a Wallin-Svensson liquor circulation system. Das Papier 2, no. 19/20: 372-3 (October, 1948). [In German]

A brief description is given of the procedures employed and results obtained in heat consumption measurements carried out in a sulfite mill in

northern Sweden equipped with four digesters of 200 cu. m. capacity each and a Wallin-Svensson liquor and gas circulation system, which operates without pumps. In the two cooking series used for these measurements, strong sulfite pulps with a Björkman number of 90-100 were produced. The heat consumption amounted to 820,000 and 840,000 kcal., respectively, per ton of ovendry pulp, which is considerably lower than the figures obtained in other mills. The details of the cooks are presented in tabulated form; two diagrams illustrate the layout of the circulation system. E.S.

COSTER, N. W., JOHNSON, L. M., and THIEME, R. I. Heat and SO_2 recovery from sulphite blowpit gases. Paper Mill News 72, no. 5: 10, 12-16, 18, 20 (Jan. 29, 1949); Pulp & Paper 23, no. 1: 34, 36, 38, 41-2, 44, 47 (January, 1949).

A method is described whereby large quantities of heat and sulfur are recovered when a sulfite digester is blown. The process for accomplishing this consists of five stages: (1) condensation of the steam in the digester blow gases in a concurrent flow condenser and collection of the condensate in a hot water accumulator; (2) the recovery of heat from this hot water by means of heat exchangers which supply heat to the acid going to the Chemipulp hot acid accumulators, and to water for use in the bleach plant; after passing through the heat exchangers, the cooled water is returned to the bottom of the hot water accumulator for reuse in the condenser; (3) the cooling of gases leaving the condenser; (4) the absorption of the sulfur dioxide present in these gases by water in a countercurrent packed absorption tower and absorption stack; (5) the collection of the sulfur dioxide solution formed and its use in the acid plant as makeup in the Jenssen towers. The equipment and operation are described in detail and illustrated by means of photographs and drawings. Actual operating figures over a period of six months show a saving of 40 pounds of sulfur and 950 pounds of steam (225 pounds 40° superheat) per airdry ton of bleached sulfite pulp. E.S.

SULFITE PROCESS—MAGNESIUM BASE

ANON. New system recovers sulphite-process chemicals, makes steam while doing it. Power 93, no. 1: 100-2 (January, 1949); *cf.* B.I.P.C. 19: 277-8.

Essentially the same information is presented as in the previous references, with particular emphasis on the recovery boilers and power equipment. E.S.

ARNST, ALBERT. No more pulp waste. Am. Forests 55, no. 1: 16-17 (January, 1949); Chemurgic Digest 8, no. 1: 4-7 (January, 1949); Western Pulp and Paper 2, no. 1: 6-9 (January, 1949).

This is a more or less popular account of the development of the magnesium base sulfite process and the recovery cycle used in the changed-over Weyerhaeuser pulp mill at Longview, Wash. Illustrations are included. E.S.

SULFITE WASTE LIQUOR

DUFRENOY, JEAN, and PRATT, ROBERTSON. The utilization of waste liquors from the pulp industry in the biosynthesis of penicillins. Papeterie 70, no. 12: 386-7, 389-91 (December, 1948). [In French] *cf.* following abstract.

This is a somewhat more complete description of the work reported previously, showing also the possible structural relationship between lignin and *p*-hydroxybenzyl penicillin (penicillin X). 32 references. L.E.W.

PRATT, ROBERTSON, and DUFRENOY, JEAN. Physiological comparison of two strains of *Penicillium*. Science 102, no. 2652: 428-9 (Oct. 26, 1945); *cf.* B.I.P.C. 15: 304.

The authors made a comparative study of the ability of *Pencillium chrysogenum* X1612 (I) and *P. sp.* NRRL 1984-A (II) to produce penicillin in various media. (II) required more complex precursors of the penicillin than did (I). Thus (I) could totally synthesize penicillin on a completely synthetic medium (although phenylacetic acid increased the yield). (II) required the presence of indolacetic acid and/or naphthaleneacetic acid in the medium to effect the penicillin synthesis. Cysteine and related compounds increased the penicillin yield. In a corn steep medium, the addition of sulfite waste liquor decreased the penicillin yield from (I) by 12-50%, but increased the yield in the case of (II), the range of increases being 8-73%. L.E.W.

SULFUR

ZABEL, HERMAN W. Canadian sulfur on the way. Chem. Inds. 63, no. 6: 960 (December, 1948).

Descriptions are given of the methods to be used by two Canadian firms for the production of sulfur for the domestic pulp and paper industry. Canadian Industries, Ltd., Copper Cliff, Ont., will produce liquid sulfur dioxide from pyritic copper-nickel ore to satisfy about 10% of the domestic sulfite pulping operations, and Noranda Mines, Ltd., Noranda, Que., will distill elemental sulfur from pyrites. Heretofore, the 300,000 tons of sulfur used in the country have been imported from Texas and Louisiana. R.R.

TALL OIL

SANDERMANN, WILHELM. Experiments for the technical recovery of sterols from tall oil. Svensk Papperstidn. 51, no. 22: 531-6 (Nov. 30, 1948). [In German; English and Swedish summaries]

The author describes three methods for the recovery of sterols from tall oil, which were developed in Germany during the war. The first method involves the separation of the sterols from the raw sulfate soap by means of simple alcohols, particularly methanol. The yield of sterols is greatly influenced by temperature. The second method covers the isolation from tall oil pitch and involves preheating and distillation of the tall oil in such a manner that the total amount of sterol is esterified and retained in the pitch. The saponification of the pitch on a large scale is preferably carried out in autoclaves in a solution of methyl alcohol, followed by extraction with benzene. The third method was never tried on a large scale; it involves the recovery of a concentrate containing 15-20% sterols from raw tall oil without distillation. Although the feasibility of sterol recovery has been demonstrated by these methods, the war economy prevented their utilization and no factories were built. 16 references. E.S.

TANNINS

BROWNING, B. L., PIGMAN, W. W., LEAF, R. L., JR., STEINERT, G., and WETHERN, J. The polarography of tannins. J. Am. Leather Chemists Assoc. 44, no. 1: 30-43 (January, 1949).

The authors report on the results of a comparative study of representative types of tannins on the basis of their polarographic characteristics and structures. Solutions of quebracho, wattle, mangrove, chestnut, and myrobalan tannins were found to be reducible at the dropping mercury electrode, giving a wave with a half-wave potential of approximately −1.0 volt. All except wattle tannin gave a second reduction wave at −1.3 to −1.6 volts. The diffusion current at −1.0 volt is markedly increased by aging at pH 7 to 8. The reduction wave at −1.0 volt is eliminated by the addition of sodium sulfite. Some polyhydric phenols and hydroxybenzoic acids, which may be related to structural units of tannin, give reduction waves in the neighborhood of −1.0 volt after aging. The nontannins, after removal of the tannins by hide powder, behave similarly to the crude extracts at the dropping mercury electrode. 7 diagrams and 4 tables. R.R.

TEXTILE INDUSTRY AND FABRICS—TESTING

BUCK, GEORGE S., JR. Flammability of consumer textiles. Am. Dyestuff Reptr. 38, no. 2: P78-84 (Jan. 24, 1949); *cf.* B.I.P.C. 17: 318.

Conclusions and recommendations are given resulting from a two-year study by the American Association of Textile Chemists and Colorists working with the Commodity Standards Division of the National Bureau of Standards on determining hazardous fabric types in respect to flammability and the degree of correlation to be obtained when several laboratories test a fabric on the inclined tester. A general discussion of the procedure and an analysis of the testing results are also included. It has been found that laboratories differ significantly in burning times for different fabrics, that there is no consistent pattern of differences between laboratories, and that the inclined tester and the horizontal tester do not show sufficient correlation to be used interchangeably. The estimate of testing error associated with the inclined tester is of such magnitude that the suggested "twilight zone" would permit too frequent acceptance of hazardous fabrics. R.R.

TRANSPARENT CONTAINERS

TENNESSEE EASTMAN CORPORATION, *Kingsport, Tenn.* Combination extruded plastic and tin can lid container. Packaging Parade 17, no. 192: 83 (January, 1949).

Sturdy attractive containers have been made from transparent extruded Tenite sheet sealed with tin can lids. To form the can, a blank of sheeting is cemented or bonded electronically on a mandrel in cylindrical shape. The lids are firmly and simply applied in a standard sealing machine. The plastic sheeting may be printed by lithography, decalcomania, or the silk screen process. R.R.

WASTE

MINNICK, L. JOHN. New fly ash and boiler slag uses. Tappi 32, no. 1: 21-8 (January, 1949).

A brief description of the early work on fly ash utilization is given. The chief use has been in the field of concrete and Portland cement products. Some successful applications as an asphalt filler have also been reported. Recent research developments are presented with particular emphasis on the utilization of fly ash and boiler slag in producing ceramic bricks. Recent work in the concrete and asphalt fields is also discussed and brief mention is made of other types of investigations which are under way. 25 references. E.S.

WATER-MARKS

WEISS, KARL THEODOR. The snake and the cross. Das Papier 2, no. 19/20: 373-5 (October, 1948). [In German]

This is a historical study dealing with the origin and occurrence of a German watermark, a snake (usually with characteristically protruding tongue and wearing a crown) winding around, sometimes over, a cross. Reference to Briquet's dictionary on watermarks is made. E.S.

WAXES

BAKELITE CORPORATION. Low molecular weight polyethylene resins open new fields of application. Plastics [U. S.] 8, no. 12: 12, 29 (December, 1948).

Reference is made to a new low molecular weight polyethylene resin (resin Dylt) now in commercial production. An important use is as an additive to upgrade paraffin wax. Waxes fortified with 2-5% resin Dylt exhibit higher blocking temperatures, superior mechanical properties, reduced rub-off, and increased strength of heat-sealed bonds. Data on compounding, compatibility with other materials, and use as a hot-melt application of paraffin wax modified with this polymer are given. E.S.

WET STRENGTH

BURSZTYN, I. On the mechanism of wet strengthening of paper. Paper-Maker (London) 117, no. 1: 26, 28-32 (January, 1949); World's Paper Trade Rev. 130, no. 27: Tech. Sup. 105-11 (Dec. 30, 1948); *cf.* B.I.P.C. 18: 637.

With frequent reference to his previous publications, the author describes laboratory experiments for finding the retention of urea- and melamine-formaldehyde resins in four different furnishes (bleached and unbleached sulfite and kraft), using the Kjeldahl method in all determinations. The details of the procedure are given; the nitrogen content of the blank sheet was subtracted from the nitrogen content of the treated sheet and the quantity of resin was calculated from the amount of nitrogen retained in the paper. The results are given in a number of diagrams. Bleached furnishes retain very much less amino resin than unbleached furnishes and the author points out that future investigations should concentrate more on the particular action of a particular resin on a particular furnish than discuss resin and paper in general. The amount of resin retained in the white water was not included in the present studies, although the author emphasizes the importance of such an investigation, which should not be limited to the laboratory, but should include the continuous testing of the white water in a mill for at least a period of a week. Data on the influence of pH and the effect of very large additions of resin on retention are given. A low pH (about 5) is absolutely essential as a catalyst, because no matter how much the treated paper is heated on the machine, no wet strength will be obtained if the pH is not sufficiently low. The experiments showed that at least as much resin is retained at pH 7 as at pH 5. However, whereas it is not possible to make an urea-formaldehyde paper with satisfactory wet strength at a pH higher than 5, it seems that it would be possible to make a melamine-resin treated paper of fair wet-strength properties at a pH nearer neutral. Up to 1% resin addition, the increase of strength is almost linear; additions higher than 2% do not cause any further spectacular increase in strength. Resin was added to two of the furnishes up to 16% of the weight of the fibers at both pH 5

and pH 7. The resulting retention curves show a linear falling off and strength curves (not given) a further flattening. The author refers to colored microphotographs described in a recent publication (*cf.* B.I.P.C. 19: 54-5) depicting that beater resins do not enter the fibers at all, but act on their surface as a waterproof cement. Since a thinner glue line gives better adhesion between two bodies to be glued, it is possible that the decrease in strength with larger resin additions to the beater may be explained by larger pieces of resin making fewer fibers waterproof and depriving others of the beneficial effect. The influence of beating on resin retention will be discussed in a future publication. E.S.

GOODALE, ROBERT P. Wet-strength papers find new applications in packaging moist food products. Food Inds. 21, no. 1: 52-3 (January, 1949).

The author discusses present applications of wet-strength papers in the food industry, including frozen foods, dairy products, grocery bags, and beverages. E.S.

WOOD

BALLANTINE, A. C. Fire-killed timber proves Alberta's pulpwood potentials. Western Pulp and Paper 2, no. 1: 26-8 (January, 1949).

The sale of fire-killed pulpwood began almost three years ago, when the possibilities of such timber as pulpwood were realized. In 1946, exports from Alberta amounted to 1648 cords. In 1948, the figure reached 182,430 cords, for which pulp mills in Minnesota and Wisconsin paid an average of $33 per cord to the vendor and 15½ cents/cwt. for freight. There are signs that this demand is decreasing. Orders are for better as well as more paper, and the use of fire-killed wood requires the removal of charred parts before processing, almost a major operation. Increases in freight rates have convinced U. S. mill operators that such imports from Alberta are no longer profitable. However, three years of experimenting with the wood have produced satisfactory results. When the pulp and paper industry becomes an enterprising part of the Province, there will be less preliminary study necessary before a satisfactory finished product can be manufactured which can be exported at considerably higher prices than the wood itself. R.R.

WOOD—CHEMISTRY

SCHOFIELD, M. Wood in the chemist's hands. Paper-Maker (London) 116, no. 6: 340-2, 344-5 (December, 1948).

The author discusses in a popular manner the different achievements in wood chemistry, including wood preservation and fireproofing, improved and modified woods in combination with plastics, and chemical products from wood. E.S.

WOOD—EXTRACTIVES

PEW, JOHN C. Douglas fir heartwood flavanone; its properties and influence on sulphite pulping. Tappi 32, no. 1: 39-41 (January, 1949); *cf.* B.I.P.C. 19: 127.

After briefly referring to the properties and means of isolation of Douglas fir heartwood flavanone, small-scale sulfite pulping experiments are described, using chips of unextracted and extracted Douglas fir heartwood and sapwood, sprucewood, sprucewood with the flavanone added to the cooking liquor, and sprucewood impregnated with the flavanone. The

results indicate that the presence of the flavanone is an important factor in the sulfite pulping resistance of this species on account of the phenolic substances present. In addition, the low permeability of the wood retards penetration and restricts normal diffusion of chemical substances in and out of the chips and also tends to maintain the soluble phenols at high concentration in the interior of the chips. Associated with these effects is the decomposition of the cooking liquor which, in turn, causes further pulping retardation. E.S.

WOOD OPERATIONS

LEMAY, P. V. Ontario mechanized logging more economical and more efficient. Pulp & Paper 23, no. 1: 58, 60, 62 (January, 1949).

Marathon Paper Mills of Canada is operating a camp with the aid of mechanized logging equipment in a manner which is revolutionary as compared with methods used a year or so ago in eastern Canada. The company finds mechanical logging more economical and efficient than the old manual process. The equipment includes six Lidgerwood cable yarders, six Skagit yarders, three Blair Equipment units, Caterpillar and International tractors, crawler arches, sulkies, Hysters, a slasher, and International trucks. Tests have shown as much as 8% more wood could be harvested off an acre when it was done mechanically. Because it can be carried on in any season except during the spring break-up, year-round operation and full-time employment are possible. By using light mobile equipment rather than heavier types, capital costs are greatly reduced. The unit is moved to the wood instead of the wood to the unit, and skidding distances are kept to a minimum. Both selective and clear-cut logging are described and illustrations are included. R.R.

WOOD WASTE

GUERNSEY, F. W. Wood waste as a source of pulp on the Pacific Coast. Pulp Paper Mag. Can. 49, no. 13: 110-12 (December, 1948).

A survey on the waste of eight Pacific Coast logging operations indicated that about 2714 cu. ft./acre was left as waste, about 19.5% of the original merchantable volume of the stand. Approximately 60% was of a size and volume to warrant its use. Material which would otherwise be left can be recovered by prelogging, relogging, or clean logging, each of which is briefly discussed. The most economical method for pulp mills to use in handling the small pieces, broken chunks, and high stumps recovered seems to be with hydraulic barkers and whole log chippers. Very little sawmill waste is destroyed in refuse burners, much of it being used as fuel. It is estimated that about 13.5% of the cubic volume of a saw log is turned into solid waste, of which 10-15% may be used for boiler fuel. Studies must be made to determine how long waste can stay on the ground after the main operation before decay and insects make it unsuitable for use and to ascertain the most economical methods of yarding and loading the recovered material. The greatest problem is finding means whereby small and medium-sized sawmills can dispose of their waste other than as fuel. R.R.

JENSEN, WALDEMAR. Surface waste in the production of birch plywood. Finnish Paper Timber J. 30, no. 23: 425-9 (Dec. 15, 1948). [In English]

The three discrete parts of plywood waste from *Betula verrucosa* are the outer bark (cork layer) (I), inner bark (II), and wood (III). The

author has compared the chemical components of (I), (II), and (III), giving the percentages of ether extractives, alcohol extractives, "suberin," Klason lignin (corrected for nonlignin components), reducing sugars, pentosans, hexosans (by difference after total hydrolysis), acetyl, formyl, protein, as well as certain other less readily classified fractions. (I) is highest in ether-soluble matter and in suberin, the sum of which accounts for over 75% of the outer bark, whereas true lignin is very low. The main components of (II) are alcohol solubles, lignin, pentosans and, to a lesser extent, hexosans, protein, and ash (1.8%). The analysis of (III) was quite normal, with 19.5% lignin, 25.2% pentosans, and 43.4% hexosans (including cellulose), and relatively low extractives. (I) on elementary analysis showed 71.2% carbon and 10% hydrogen, in contrast to 49.8% carbon and 6.2% hydrogen in (III). (I) also has by far the highest calorific value, 8260 kcal./kg. in contrast to 4790 kcal. in the case of (III). Details are given of comparative pyrolysis experiments with (I), (II), and (III). In these (I) furnished the greatest amount of tar [57.7% as contrasted to 4.6% from (III)] and the lowest amounts of acetic acid, methanol, and gaseous products. The greatest single fraction from (I) was "neutral oil" (45.6%). A rational solution of the waste problem seems to be a successful separation of the three components [(I), (II), and (III)] from each other. Of these, (I) might be subjected to pyrolysis, keeping in mind that the products are very different from those usually obtained from wood, (II) could be used in tanning or in furfural production, and (III) could be defibered and used in wallboard manufacture. L.E.W.

X-RAY RESEARCH

PERCIVAL, E. G. V., and ROSS, ALAN G. The cellulose of marine algae. Nature 162, no. 4127: 895-6 (Dec. 4, 1948).

Chemical (presence of glucose residues exclusively and of 1,4-β-linkages) and x-ray evidence is presented to show that algal cellulose is fundamentally similar to the cellulose of land plants, although it should not be assumed that the celluloses are identical in every respect. 12 references. E.S.

PRESTON, R. D., WARDROP, A. B., and NICOLAI, E. Fine structure of cell walls in fresh plant tissues. Nature 162, no. 4129: 957-9 (Dec. 18, 1948).

The authors have studied x-ray photographs of an alga, *Rhizoclonium*, and cambial tissue from *Pinus sylvestris*, to compare the fresh and dried material in regard to the existence of micelles and special orientation. In the wet alga specimen, the arcs of the cellulose diagram are very apparent and are as sharp as those in the dry material; the deposition of the arcs is the same. It is apparent, therefore, that, in the fresh material, the cellulose is organized into micelles, which have the special orientation demonstrated in dried cells. In cambium, it is evident that the micelles exist in fresh tissue much as in dry material. It is not clear that the micelle size is the same in the wet and dried tissue, but it is certain that, in the materials used, sufficiently extensive crystalline regions exist to give rise to x-ray diagrams. It will probably be necessary to continue studies of growth processes in plant cells in terms of wall structure substantially similar to that described for dried material. 4 figures. R.R.

YEAST

ANON. Rising *Torula*. Chem. Inds. 64, no. 1: 37 (January, 1949).

Brief reference is made to the yeast plant of the Lake States Yeast Corp. at Rhinelander, Wis. It is considered an experimental unit on which others may be patterned if it is successful. It is located on the property of the Rhinelander Paper Co. and utilizes *Torula utilis* and sulfite waste liquor for producing dried yeast high in proteins, enzymes, and vitamins for animal feeds. E.S.

Patent Section

Although the abstracts of the United States patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. The abstracts of the Canadian patents are prepared from the claims published in the* Canadian Patent Office Record. *In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents are available only as manuscript or photostatic copies. They are furnished by the Commissioner of Patents, Ottawa, Canada. An estimate of the cost of a patent should be obtained in advance of the order.

ADHESIVES

BAKER, CHESTER L., and SAMS, ROBERT H. Adhesive and method of making. U. S. patent 2,457,108. Filed July 24, 1943. Issued Dec. 28, 1948. 16 claims. Assigned to Philadelphia Quartz Company.

A dry-mix adhesive is formed by mixing 65 parts of soya flour (containing 50-53% of protein), 2 parts of a steam-distilled pine oil, and 33 parts of sodium silicate (containing about 11% sodium monoxide, 31.9% silicon dioxide, and 57% water); mixing was continued until a dry appearing crumbly mass was obtained. When mixed with water in the proportions of about one part dry mix to four parts of water, it forms an adhesive which, after being set by heat, with or without pressure, shows a high retention of the glue line for an immersion period of about 24 hours. Various other formulas are given. The dry-mix adhesives are well adapted to the machine fabrication of paperboard. C.J.W.

FENN, JAMES E. Novel adhesive product and process of making same. U. S. patent 2,457,357. Filed June 14, 1947. Issued Dec. 28, 1948. 9 claims.

Concentrated sulfite waste liquor is mixed with 0.5 to 3% (best 1.2%) phosphoric acid on the liquid basis of the liquor, the mixture stirred from one to three hours, and heated to 175 to 190° F. A method is described for determining the optimum quantity of phosphoric acid needed. When used with paper or corrugated board, it develops a strong initial bond which weakens to a small extent on drying, which gives it an advantage as a palletizing adhesive. The adhesive can be blended in any desired proportions with starch, dextrin, and animal glue, as well as with polyvinyl alcohol, hydroxyethylcellulose, methylcellulose, and carboxymethylcellulose. C.J.W.

BLEACHING

CEDERQUIST, KARL N. Method of bleaching cellulosic material. Canadian patent 454,238. Filed Nov. 5, 1946. Issued Jan. 18, 1949. 4 claims. Assigned to Stora Kopparbergs Bergslags Aktiebolag.

A pulp suspension in which is uniformly distributed an alkali metal or an alkaline earth metal oxide, hydroxide, or carbonate is treated with

chlorine dioxide. The introduction of the chlorine dioxide is interrupted before the bleaching is completed and the bleaching action is allowed to proceed to completion. The chlorite which is formed can be activated by acidifying the solution or by the addition of chlorine. C.J.W.

BLEACHING—GROUNDWOOD

MCEWEN, ROBERT L., and SHELDON, FRED R. Method of bleaching ground wood. Canadian patent 453,804. Filed April 21, 1947. Issued Jan. 4, 1949. 5 claims. Assigned to Buffalo Electro-Chemical Company, Inc.

Groundwood fibers are formed into a web which is dewatered to a moisture content of less than 250% and then treated, at least on one face, with an aqueous alkaline bleaching solution consisting of a peroxide and a soluble phosphate as the essential ingredients. One claim mentions heating the web prior to bleaching to remove additional water; in another, the web is heated after the addition of the bleaching agent. C.J.W.

BOARD

GREGERTSEN, BJÖRN. Building non-conductive board and process for producing them. Canadian patent 454,279. Filed Jan. 26, 1945. Issued Jan. 25, 1949. 6 claims. Assigned to Aktiebolaget Molnbacka-Trysil.

A structural board consists of two retaining layers of continuous sheet and an intermediate layer composed of a mass of crinkled strips of paper adhesively secured to each other by commonly used adhesive, the strips of paper being capable of resisting defibration by water. The strips are treated with asphalt, bitumen, wax, or a resinous compound. C.J.W.

BOARD SPECIALTIES

HALL, MAYNARD G., and HURBAN, THOMAS, JR. Bottle carrier. U. S. patents 2,457,307 and 2,457,308. Filed July 12 and Nov. 9, 1945. Issued Dec. 28, 1948. 15 and 4 claims. Assigned to Empire Box Corporation.

The inventions cover a preformed collapsible bottle carrier from cardboard or like material; a particular feature is the construction of the ends of the container. C.J.W.

LUPTON, ELMER H. Bottle carrier. U. S. patent 2,458,281. Filed Oct. 20, 1944. Issued Jan. 4, 1949. 1 claim. Assigned to The Bartgis Bros. Company.

The construction of a cardboard bottle holder is described; the holder can be folded flat for storage and shipment. C.J.W.

RINGLER, WILLIAM A. Bottle carrier. Canadian patent 453,844. Filed Nov. 12, 1947. Issued Jan. 4, 1949. 7 claims. Assigned to The Gardner-Richardson Company.

This is identical with U. S. patent 2,371,317 (March 13, 1945). C.J.W.

TROGMAN, WILLIAM. Box and package handle. U. S. patent 2,458,883. Filed Nov. 13, 1944. Issued Jan. 11, 1949. 1 claim.

The construction is described of a one-piece handle having a finger guard which serves to provide a substantial bearing face engageable with the fingers. It is formed from a single sheet of material. C.J.W.

CALCIUM CARBONATE

RAFTON, HAROLD R. Treatment of pigment comprising calcium carbonate. Canadian patent 453,900. Filed July 30, 1943. Issued Jan. 4, 1949. 12 claims. Assigned to Raffold International Corporation.

This is equivalent to U. S. patent 2,447,532 (Aug. 24, 1948); *cf.* B.I.P.C. 19: 130. C.J.W.

DIGESTERS—FILLING DEVICES

RICHTER, JOHAN C. F. C. Apparatus for charging fibrous material into a digester. U. S. patent 2,459,180. Filed July 30, 1945. Issued Jan. 18, 1949. 8 claims. Assigned to Aktiebolaget Kamyr.

The apparatus consists of a feeding screw provided in the feeding end of the digester and surrounded by a sieve in a sieve housing and a sluicing device for the fibrous material, such as a rotary cell wheel surrounded by a casing, and at least two conduits which connect the sluicing device with opposite sides of the sieve and thus form a circulation system through the sluicing device and the sieve housing. A pump is provided for the circulation of the liquid. By means of this equipment chips can be charged into the liquor-filled space of a digester under pressure. C.J.W.

DISPENSING CONTAINERS

FOOTE, JAMES. Packaging. U. S. patent 2,458,844. Filed Jan. 5, 1946. Issued Jan. 11, 1949. 18 claims. Assigned to B.F.D. Company.

A carton for dispensing wax paper in rolls is described. C.J.W.

FLAX

ZEEHUISEN, JACOB J. Chemical retting process of producing bast fibers. U. S. patent 2,457,856. Filed March 28, 1940. Issued Jan. 4, 1949. 2 claims. Vested in the Attorney General of the United States.

The process is illustrated by the following example: 100 kg. of flax are immersed in 1600 liters of a bath containing 0.5% hydrogen peroxide, 0.5% ammonium phosphate, 1% urea, and 0.5-1% ammonium carbonate. The temperature of the bath is initially 50° and is raised during the operation to 80-100° C. The time of treatment is 1 to 1.5 hours. The fibrous material is rinsed with hot water which may contain some hydrogen sulfide. C.J.W.

FOLDING BOXES

CHATEAUNEUF, ARCHIE J. Container. U. S. patent 2,458,834. Filed April 9, 1946. Issued Jan. 11, 1948. 2 claims.

In ornamental display boxes which are composed of a plurality of sections, the adjacent edges of the sections are connected with strips of flexible material, the connections being rigid and highly ornamental. C.J.W.

CHEMLINSKI, RAYMOND. Combined bottle container and support. U. S. patent 2,458,766. Filed Jan. 16, 1947. Issued Jan. 11, 1949. 1 claim.

The construction of a rectangular container is such that a portion of the top wall may be raised to insert a bottle. A portion of the raised part can be used to brace the bottle in its upright position within the aperture in the carton. C.J.W.

EVANS, GUY J. Folding box. U. S. patent 2,458,578. Filed May 31, 1946. Issued Jan. 11, 1949. 1 claim.

The patent relates to a folding box for cake or other commodity; the side wall is made from a strip of sheet material which is bent in the form of a cylinder and has its opposite ends connected by fastening means. C.J.W.

HENSLEY, CLAUDE H. Folded-blank box tray. U. S. patent 2,459,645. Filed July 5, 1946. Issued Jan. 18, 1949. 2 claims. Assigned to Gaylord Container Corporation.

A method is described for the formation of folded-blank box trays in which two of the sides have corner flaps folded inward and secured by folding over upper marginal flaps of the other two sides. C.J.W.

RICHARDSON, RALPH R. Reclosable box. Canadian patent 453,995. Filed April 23, 1946. Issued Jan. 11, 1949. 2 claims. Assigned to Chicago Carton Company.

A paperboard carton has a score line extending around the carton in spaced relation to an end thereof so as to permit opening the carton by separation of a shallow cap-like end section from the main body of the carton. Other details of the construction are given. C.J.W.

RIEGE, HAROLD F., and SIEWERT, EDWIN C. Collapsible carton. Canadian patent 454,022. Filed Feb. 17, 1948. Issued Jan. 11, 1949. 1 claim. Assigned to Marathon Corporation.

Details are given of the construction of a one-piece paperboard blank which is designed for automatic high-speed machine assembly into a collapsible carton. C.J.W.

SHANNON, FRANK. Foldable container. Canadian patent 454,139. Filed Jan. 29, 1947. Issued Jan. 18, 1949. 5 claims. Assigned to Automatic Paper Box Co. Ltd.

The construction of a multisided foldable container is described. Provision may be made for handle extensions. C.J.W.

WEISS, ARTHUR J. Carton. Canadian patent 454,297. Filed Sept. 6, 1946. Issued Jan. 25, 1949. 17 claims. Assigned to Robert Gair Company, Inc.

A method is proposed for forming a carton blank which has duplex end flaps. C.J.W.

WENZEL, FREDERICK W. Carton and display stand. U. S. patent 2,457,291. Filed Feb. 10, 1945. Issued Dec. 28, 1948. 5 claims. Assigned to Hummel & Downing Company.

Means are provided for interlocking the several parts of a display carton in a manner to provide a partition or partitions during the course of the carton erection; the cover serves as an advertising display medium when open. C.J.W.

HEATING (HIGH-FREQUENCY)

COHOE, WALLACE P., and SASLAW, MAX R. Method and apparatus for drying sheet materials. U. S. patent 2,459,623. Filed May 5, 1945. Issued Jan. 18, 1949. 14 claims. Assigned to Fred'k H. Levey Co., Inc.

The method and apparatus are described for subjecting paper and the like to an electric field for heating them to remove water and organic solvents. Electrodes with a circular cross section are employed to minimize the voltage gradient at the surfaces and an air dielectric between the electrodes. C.J.W.

COHOE, WALLACE P., and WILSON, MITCHELL. Method of and apparatus for drying sheet materials by high-frequency electric fields. U. S. patent 2,459,622. Filed March 18, 1944. Issued Jan. 18, 1949. 15 claims. Assigned to Fred'k H. Levey Co., Inc.

A method for drying coated paper, a printed paper web, and the like consists in maintaining a plurality of substantially parallel spaced electric fields, unaccompanied by corona discharge, between spaced pairs of electrodes connected to a source of high-frequency, alternating current, moving the electrodes and the resulting electric fields in a continuous path and advancing the sheet over and in peripheral contact with the electrodes at a rate different from that at which the electrodes are moving; the region of greatest intensity of the electric fields is caused to deviate from its normal path directly between the electrodes and passes through the sheet. C.J.W.

LEATHER—TESTING

MANN, CHARLES W. Apparatus and method for determining the scuff resistance of leather. U. S. patent 2,458,953. Filed Feb. 24, 1947. Issued Jan. 11, 1949. 10 claims. Assigned to the United States of America as represented by the Secretary of Agriculture.

An apparatus is described for determining the scuff resistance of leather. The principle might be applied to the testing of paper. C.J.W.

MACHINERY—CONVERTING MACHINERY

CAKE, ANDREW R. Carton folding machine. U. S. patent 2,458,341. Filed Aug. 3, 1944. Issued Jan. 4, 1949. 19 claims.

Improvements are claimed for a machine for folding paper or cardboard cartons or boxes. C.J.W.

DELOYE, JAMES J. Interfolding machine. Canadian patent 454,185. Filed Oct. 12, 1946. Issued Jan. 18, 1949. 8 claims. Assigned to International Cellucotton Products Company.

A machine is claimed for interfolding paper sheets. C.J.W.

EATON, LEWIS B., and VERGOBBI, ROBERT W. Means and method for producing infusion bags with nontangling handles. U. S.

patent 2,457,216. Filed Dec. 11, 1945. Issued Dec. 28, 1948. 27 claims. Assigned to Pneumatic Scale Corporation, Limited.

The patent covers an apparatus for producing bags, particularly infusion bags, having provision for attaching a handle comprising a tag and a length of twine to the bag. C.J.W.

HOWARD, STANLEY R. Apparatus for producing filled bags. U. S. patent 2,457,237. Filed June 4, 1947. Issued Dec. 28, 1948. 11 claims. Assigned to Pneumatic Scale Corporation, Limited.

The invention covers a novel bag-making machine in which provision is made for attaching to the bag a handle comprising a length of twine and a tag to produce nontangling bags ready for packing. C.J.W.

MACHINERY—JORDANS

LARSON, OSCAR E. Jordan plug jacket. Canadian patent 453,981. Filed Jan. 13, 1947. Issued Jan. 11, 1949. 4 claims. Assigned to John W. Bolton & Sons, Inc.

The construction of a jordan plug is described. C.J.W.

STUCK, HAROLD D. Layered jordan cutting member. Canadian patent 453,982. Filed Jan. 31, 1947. Issued Jan. 11, 1949. 3 claims. Assigned to John W. Bolton & Sons, Inc.

A stock treating member in a jordan is composed of a plurality of resilient parallel sheets (each of thin metal) which are fastened together near one edge and are free at the opposite or stock-treating edge. C.J.W.

MACHINERY—MIXING APPARATUS

COWLES, EDWIN. Apparatus for disseminating materials in liquids. Canadian patent 453,998. Filed Nov. 29, 1943. Issued Jan. 11, 1949. 8 claims. Assigned to The Cowles Company.

This corresponds to U. S. patent 2,424,679 (July 29, 1947); *cf.* B.I.P.C. 18: 68. C.J.W.

MACHINERY—SCREENS

DOWNS, HENRY W., JR. Sealing strip for pulp and other type of screen plates. Canadian patent 454,262. Filed March 10, 1947. Issued Jan. 25, 1949. 6 claims.

A method is described for holding a screen plate on a support frame in a vat. C.J.W.

MACHINERY—UNWRAPPING MACHINE

BERCH, SAMUEL H. Carton opener. U. S. patent 2,459,678. Filed Feb. 7, 1947. Issued Jan. 18, 1949. 11 claims. Assigned to Arden Farms Co.

This patent covers a machine for use in unwrapping cartons such as those described in U. S. patent 2,443,530 (June 15, 1948) (*cf.* B.I.P.C. 18: 803); it is designed particularly for opening containers holding ice cream. C.J.W.

MOLDED PULP ARTICLES

ISTA, PAUL E. Apparatus for manufacture of fibrous articles. U. S. patent 2,460,129. Filed Aug. 8, 1946. Issued Jan. 25, 1949. 2 claims. Assigned to General Electric Company.

In the molding of pulp articles which have different physical properties in different portions of the article, the fibrous components are deposited and integrated from a plurality of columns. Each of the columns is separated from the adjacent columns by walls, the edges of which at various stages during the forming operation are either against the surface of the form or are spaced to a predetermined degree from the surface of the form so as to limit mixing of the various fibrous suspensions. Various operational details are given. C.J.W.

PAPER—COATED

BARRETT, WILLIAM. Apparatus for coating paper. U. S. patent 2,457,433. Filed Nov. 24, 1943. Issued Dec. 28, 1948. 6 claims. Assigned to Minnesota and Ontario Paper Company.

A coating of high solid content is spread onto the surface of a roll in a smooth and predetermined thickness which is then transferred to a fast moving web of paper (up to 1200 ft./min.). The applied coating requires no smoothing or other similar treatment. The coated web is given a preliminary set by a drier drum heated with steam, electricity, gas, etc. The web leaves the drying roll on a felt, passes over a number of additional rolls, and then to a winder. C.J.W.

PAPER—COATED (HOT-MELT)

SALO, MARTIN. Coating compositions for moistureproofing by hot melt coating. U. S. patent 2,458,428. Filed Dec. 12, 1945. Issued Jan. 4, 1949. 5 claims. Assigned to Eastman Kodak Company.

A nonblocking melt-coating composition adapted to give coatings of low moisture vapor permeability contains from 64 to 70% of cellulose acetate butyrate (butyryl content of 50% and a viscosity of a 10% solution in acetone of 100 centipoises), 13-23% of di(2-ethylhexyl) phthalate, 10-18% of polyvinyl acetate, and 1% of paraffin wax. Such a mixture is heated four hours at 160-180° C. and can be used for coating glassine paper; the resulting paper has a water-vapor permeability of 0.024. Other examples are given. C.J.W.

PAPER—CURLING

HUGHEY, CARTER J. Photographic print straightener. U. S. patent 2,458,381. Filed Nov. 30, 1946. Issued Jan. 4, 1949. 6 claims. Assigned to Eastman Kodak Company.

The print straightener consists of a base of wood, wallboard, or plastic to the upper surface of which is attached a resilient pad. C.J.W.

PAPER SPECIALTIES

CHARLES, ROBERT F., and DURGIN, FRANK W. Creped paper and method of making. U. S. patent 2,459,364. Filed Dec. 5, 1944.

Issued Jan. 18, 1949. 8 claims. Assigned to Dennison Manufacturing Company.

Paper is impregnated with an aqueous solution of a polymerizable synthetic resin, creped to produce a high ratio crepe above 1.5: 1, and heated to polymerize the resin. The quantity of resin in the paper is sufficient to impart elastic return thereto both when wet and dry but insufficient to produce brittleness and stiffness. An example of the impregnating solution is: dimethylolurea 6.25 grams, aluminum sulfate 0.1875 gram, water 25 cc., and 75 cc. Methyl Cellosolve. It is advantageous to add a certain quantity of a plasticizer or softening agent, such as glycerol, glycol, sugar, urea, or the like. Water repellency can be obtained by adding Aridex WP or other waterproofing solution; an absorbent finish results by the addition of a rewetting agent such as Aerosol OT. C.J.W.

CROUSE, GEORGE B. Article for reproducing drawings on blanks. U. S. patent 2,459,266. Filed Aug. 30, 1944. Issued Jan. 18, 1949. 4 claims. Assigned to Photo-Positive Corporation.

A light-sensitive sheet for reproducing drawings on a template or other part to be manufactured consists of a bottom base sheet of paper, a flexible waterproof pellicle thereon, a photosensitive emulsion coated on the upper face of the pellicle, followed by a coating of cellulose nitrate and a top layer of thermoplastic, substantially transparent adhesive. The method of use is described. C.J.W.

DRUMMOND, DONALD L. Envelope having tamper detection means. U. S. patent 2,457,809. Filed Aug. 23, 1945. Issued Jan. 4, 1949. 5 claims.

Perforations are made in the flaps of the envelope so that tears will occur if the envelope is tampered with. Also, indicator paper is attached to the flap which will be discolored if the enveloped is steamed open. C.J.W.

HAMILTON, KENNETH C. Paper cup having a pouring lip extending outwardly from side wall. U. S. patent 2,459,073. Filed Nov. 4, 1944. Issued Jan. 11, 1949. 6 claims. Assigned to Milwaukee Lace Paper Company.

As the last step in the manufacturing operation, a paper cup is provided with a pouring lip; the cup is so formed as to provide a plurality of thicknesses of material in the portion of the cup side wall forming the lip. C.J.W.

JONES, JOHN P. Cream dispenser. U. S. patent 2,459,130. Filed Jan. 12, 1946. Issued Jan. 11, 1949. 6 claims. Assigned to The Dairy Specialties Company, Incorporated.

The waxed paper-type of milk and cream containers is provided with a cream dispenser in the overlapping portions. The construction is described. C.J.W.

JONES, JOHN P. Milk container. U. S. patent 2,457,822. Filed April 26, 1944. Issued Jan. 4, 1949. 4 claims. Assigned to Dairy Specialties, Inc.

A paper milk bottle is provided with a perforated partition at the lower cream level. C.J.W.

KARDON, EMANUEL S. Shopping bag handle. U. S. patent 2,458,173. Filed Dec. 18, 1945. Issued Jan. 4, 1949. 5 claims. Assigned to American Bag & Paper Corporation.

A method is described for forming a reinforced handle for a shopping bag from tough paper or the like. C.J.W.

MELTON, ROMIE L., BENNER, RAYMOND C., and KIRCHNER, HENRY P. Apparatus for manufacture of coated webs. U. S. patent 2,457,256. Filed Dec. 29, 1939. Issued Dec. 28, 1948. 15 claims. Assigned to The Carborundum Company.

This is a continuation of U. S. patent 2,187,624 (Jan. 16, 1940) and relates to machinery for applying abrasive particles to a web by electrostatic deposition. C.J.W.

OSBORNE, FAY H. Method of making synthetic fibre paper. Canadian patent 454,001. Filed Nov. 28, 1946. Issued Jan. 11, 1949. 7 claims. Assigned to C. H. Dexter & Sons, Incorporated.

A thin, porous, light-weight, finished tissue paper of substantial strength is formed of at least 90% unbeaten viscose fibers (at least ⅛ inch long) matted and held together in paper form with 2 to 10% of a fibrous cellulosic flock binder composed of microscopical fibrils obtained by highly hydrating natural fibers in water suspension, the viscose fibers being uniformly distributed throughout the sheet in substantially their original form. C.J.W.

OSBORNE, FAY H. Thermoplastic paper and process of preparing the same. Canadian patent 454,000. Filed Nov. 28, 1946. Issued Jan. 11, 1949. 4 claims. Assigned to C. H. Dexter & Sons, Incorporated.

This is equivalent to U. S. patent 2,414,833 (Jan. 28, 1947); *cf.* B.I.P.C. 17: 329. C.J.W.

ROSEN, SHY. Art of producing composite commodity wrapper. Canadian patent 454,312. Filed April 12, 1947. Issued Jan. 25, 1949. 17 claims. Assigned to Milprint, Inc.

A composite wrapper for snugly embracing and enclosing a bread loaf is formed by securing a re-enforcing strip to one side of a sheet of wrapper stock, perforating the sheet along the strip, severing the sheet into two parts adjacent to the perforations to produce a tear strip between the edge of one part and the row of perforations, separating the severed parts to provide an intervening gap, and connecting the opposite edges of another sheet to the opposite side of the edge portions of the original sheet adjacent to the gap. C.J.W.

ROSEN, SHY. Commodity wrapper. Canadian patent 454,311. Filed April 12, 1947. Issued Jan. 25, 1949. 4 claims. Assigned to Milprint, Inc.

This patent covers the method of wrapping a loaf of bread with the wrapper covered by the previous patent. **C.J.W.**

WOLF, HOWARD A. Method of making a bag having a filler mouthpiece in one end. U. S. patent 2,458,972. Filed Dec. 1, 1945. Issued Jan. 11, 1949. 1 claim. Assigned to Wolf Brothers.

A method is proposed for securing a mouthpiece in one end of a paper or fabric bag adapted to be used with a vacuum cleaner. C.J.W.

PHYSICAL TESTING—COATED FILMS

VAN DEN AKKER, JOHANNES A. Film extensibility testing method and apparatus. U. S. patent 2,457,788. Filed Sept. 29, 1945. Issued Dec. 28, 1948. 9 claims. Assigned to the United States of America as represented by the Secretary of War.

An apparatus is described for testing the extensibility of a film of paint, lacquer, adhesive, or other material adapted to be applied as a liquid coating. C.J.W.

PITCH TROUBLES

CARPENTER, CHARLES, PORTER, COVER C., FOX, JOSEPH S., SCHREIBER, ALAN P., and BRADY, HAROLD V. Means and method of controlling pitch in groundwood and paper products. Canadian patent 454,036. Filed May 4, 1942. Issued Jan. 11, 1949. 7 claims. Assigned to Southland Paper Mills, Inc.

Pine or like wood containing approximately 2 to 4% of pitchy material is ground in the presence of alum, the concentration of which is sufficient to effect fixation of the pitchy material on the individual wood fibers; the concentration of alum in the process is maintained through the head box of the paper machine so as to carry the fixation of the pitchy material into the manufactured paper. C.J.W.

SHIPPING CONTAINERS

ERB, GEORGE C. Container. Canadian patent 453,970. Filed Dec. 11, 1946. Issued Jan. 11, 1949. 4 claims. Assigned to American Can Company.

The container consists of a rectangular tubular fiber body and a rectangular metallic end member. The method of construction is outlined. C.J.W.

LEE, WILLIAM R. Display box. U. S. patent 2,459,565. Filed April 10, 1946. Issued Jan. 18, 1949. 1 claim.

The patent relates to a box and filler suitable for the shipment and display of flowers. C.J.W.

MOORE, GEORGE A. Container. Canadian patent 454,095. Filed March 10, 1947. Issued Jan. 18, 1949. 7 claims.

A container with hermetically sealed ends is formed of an outer blank of reinforcing cardboard having score lines defining side and end panels and an inner liner of laminated sheet material consisting of a heat-sealable web and a fibrous sheet, the latter being laminated to the outer blank and extending marginally beyond the perimeter thereof. C.J.W.

SALKOWITZ, MORTIMER B. Shockproof bottle container. U. S. patent 2,458,737. Filed Feb. 26, 1947. Issued Jan. 11, 1949. 3 claims.

A safety container for bottles or the like consists of a composite tubular liner sleeve including an outer and an inner tube of paper stock and an interspacer of corrugated board, together with two sheet metal end disks. C.J.W.

SHIPPING CONTAINERS—FROZEN FOODS

BELL, JOHN G. Container and blank therefor. U. S. patent 2,457,198. Filed Oct. 22, 1945. Issued Dec. 28, 1948. 8 claims. Assigned to Morbell Products Corporation.

The invention relates to a double-walled container having a cylindrical wall which is suitable for packaging food stuffs, such as bulk ice cream. The construction is sufficiently rigid without metallic reinforcement. C.J.W.

MAGILL, DONALD G., and BIGGER, RICHARD P. Container and method of producing same. Canadian patent 453,969. Filed Nov. 26, 1946. Issued Jan. 11, 1949. 11 claims. Assigned to American Can Company.

The construction of a semirigid container for frozen foods, consisting of a tubular fibrous body and a metal end member, is described. C.J.W.

TILLERY, HUBERT B. Bulk ice-cream container. U. S. patent 2,459,727. Filed March 7, 1946. Issued Jan. 18, 1949. 2 claims.

The method of constructing an octagonal container is described; it has a removable or piston-like bottom for removal of the contents. C.J.W.

TILLERY, HUBERT B. Bulk ice-cream container. U. S. patent 2,459,728. Filed March 7, 1946. Issued Jan. 18, 1949. 2 claims.

The container proper is composed of two parts, the side walls and bottom retainer and the bottom, the latter being used as a piston to eject the contents of the box when desired; a separate cover is provided. The folded-in corners form openings below the bottom which allow air circulation. C.J.W.

SHIPPING CONTAINERS—MULTIWALL BAGS

GEIMER, WILLIAM J. Bag closure. Canadian patent 454,283. Filed April 23, 1946. Issued Jan. 25, 1949. 1 claim. Assigned to Bemis Bro. Bag Co.

A method is described for sealing a bag with a flexible sealing tape to produce a moisture-resistant permanent and hermetic closure for the container. C.J.W.

HOPPE, EDGAR B. Multi-ply pasted end bag. Canadian patent 454,045. Filed Jan. 13, 1947. Issued Jan. 11, 1949. 4 claims. Assigned to St. Regis Paper Company.

A method is described for forming a multi-ply paper bag having a

pasted end closure in which the outer ply is slit to form side and corner flaps and the closure has a corner fold formed by the flaps. C.J.W.

STARCH

CRAIG, WILLIAM L. Process for the preparation of a pigment complex, including a reacted starch. U. S. patent 2,457,797. Filed June 16, 1945. Issued Jan. 4, 1949. 3 claims. Assigned to R. T. Vanderbilt Company, Inc.

Aqueous solutions of calcium chloride react with starch to produce a complex from which improved carbonate and borate pigments can be prepared. Concentrations approaching saturation with respect to calcium chloride are required to effect the reaction—e.g., a 55% solution will react whereas a 35% solution will not. In an example, a solution of 111 parts (by weight) of calcium chloride in 200 parts of water is treated with 12 parts of raw starch; the mixture is stirred at 20-25° C., the time depending on the nature of the starch—e.g., two or three minutes for potato starch, three to four hours for cornstarch. In the second stage, a solution of 106 parts of sodium carbonate in 500 parts of water at 70° C. is added to the above starch solution; alternatively, a solution of 382 parts of sodium tetraborate (with 10 moles of water) in 2000 parts of water at 40-70° C. can be used. The products are suitable filling or coating agents for paper. C.J.W.

SULFITE WASTE LIQUOR

MEADE, REGINALD E., RODGERS, NELSON E., and POLLARD, HENRY L. Method of preparing riboflavin from lacteal material. U. S. patent 2,433,232. Filed Nov. 11, 1944. Issued Dec. 23, 1947. 6 claims. Assigned to Western Condensing Company.

In a process for manufacturing a vitamin concentrate including riboflavin by fermenting a lacteal lactose-containing material with *Clostridium acetobutylicum* (U. S. patent 2,369,680 [Feb. 20, 1945]), improved yields are obtained by the addition of xylose to the whey or other material. Sulfite waste liquor can be used as a supplement since it contains xylose as a component of the pentose fraction of the wood sugars (depending on the wood used, sulfite waste liquor will contain from one to three grams of xylose per liter). C.J.W.

TALL OIL

STUBBLEBINE, WARREN. Tall oil-cellulose ether composition. U. S. patent 2,457,847. Filed July 31, 1943. Issued Jan. 4, 1949. 14 claims. Assigned to Armstrong Cork Company.

A mixture of 200 parts unrefined tall oil and 100 parts ethylcellulose is heated one hour at 300° F.; 175 parts of the hot mixture is mixed with 225 parts of serpentine, 210 parts ground limestone, 50 parts cork dust, and 45 parts coloring pigments. The product can be used for coating burlap, cotton, asphalt saturated felt, or the like and on passage through rolls at 250-300° F. gives a high gloss surface suitable for floor and wall coverings. In another example 50 parts of unrefined tall oil are used with 40 parts of ethylcellulose and 25 parts cumar resin C-3 or with 40 parts of benzylcellulose and 15 parts of chlorinated diphenyl. If a hard product suitable for molding is desired, the proportions may be 80% ethylcellulose and 20% tall oil. C.J.W.

TURPENTINE

McGREGOR, GEORGE H. Method of refining sulfate turpentine. U. S. patent 2,459,570. Filed June 27, 1947. Issued Jan. 18, 1949. 5 claims. Assigned to Minnesota and Ontario Paper Company.

A method of removing the odor from sulfate turpentine is described. About 10 parts of sulfate turpentine is treated at 80-100° F. with five parts of kraft green liquor (added in several increments). The upper layer, containing the turpentine, is treated with a bleaching agent such as calcium hypochlorite; the quantity of active chlorine required will vary from 4 to 12% of the weight of the turpentine. The purified turpentine is then agitated with activated carbon. C.J.W.

WET STRENGTH

DANIEL, JOHN H., JR., and LANDES, CHESTER G. Wet strength paper process for the production thereof. Canadian patent 454,131. Filed April 18, 1947. Issued Jan. 18, 1949. 17 claims. Assigned to American Cyanamid Company.

Paper containing from 0.5 to 5% of its dry weight of an uncured thermosetting resin formed of one mole of an ethylenepolyamine and two moles of α-dichlorohydrin is cured by heat to give a product with increased wet strength. C.J.W.

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